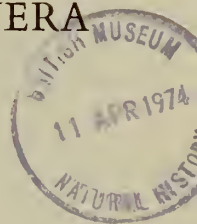


THE GENUS *ALOEIDES* AND ALLIED GENERA
(LEPIDOPTERA : LYCAENIDAE)



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By G. E. TITE & C. G. C. DICKSON

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SYNOPSIS

The genus *Phasis* Hübner as interpreted by Aurivillius (1924 : 424-431) is revised, and its species allocated to nine genera, five of which are new. With the exception of those already dealt with (Tite & Dickson, 1968 : 367-388), all species of *Aloeides* are included, eight new species and eight new subspecies being described and figured. Keys are provided for the genera, and for the species and most of the subspecies of *Aloeides*. Details of the life histories of two species are given, and addenda to 'The *Aloeides thyra* complex' (Tite & Dickson, loc. cit.) are included, with a description of yet another new species.

INTRODUCTION

IN the course of the study of the *Aloeides thyra* complex, it was often found necessary to consider other members of the genus, and this led to the conviction that these other species presented many unsolved problems. To define the very homogeneous group of species here included in the genus *Aloeides*, it has been found necessary to make a reappraisal of the taxa dealt with by Aurivillius (1924 : 424-431) under the genus *Phasis* Hübner. That author divided *Phasis* into three subordinate groups as follows: 1. *Phasis*; 2. *Aloeides*; and 3. *Poecilmitis*

and *Chrysoiritis*. Examination of the species included under these headings leads to the conclusion that certain of them are misplaced, that differences of more than subgeneric value are involved, and that the introduction of five new genera is desirable. There is a possibility that the genera *Poecilmitis* and *Chrysoiritis* are also in need of revision, but this is beyond the scope of the present work, and it is not proposed to deal with them in detail. In the case of the other genera, the known species are listed in the text. Clark & Dickson (1956 : 195-215) have included many of the species concerned in their suggested classification of the Lycaenid genera, founded on characters obtaining in the early stages. It is gratifying to note how well their classification does agree with that given below, which was first evolved from characters appertaining to the adult stage. A definitive adult character is that in certain genera the lower extremity of the tibia in the first and second pair of legs is furnished with a strong, slightly curved, downwardly directed spur, very similar to that found in the same position on the fore legs of the European *Plebejus argus* (L.). The presence or absence of this spur serves to divide the nine genera here defined into two groups. It is known that the wing-venation of butterflies may be variable, as are most other characters frequently used as aids to classification. All the venational characters mentioned below are found to be constant in all the specimens examined; it is deemed therefore that they, in conjunction with other characters, do have generic value.

To avoid much repetition in the drawing up of the descriptions of the species of *Aloeides*, the terminology of the wing characters used in dealing with the *Aloeides thyra* complex (Tite & Dickson 1968 : 370-371, text-figs 1 & 2) has been followed. It should be remembered that in the species now under discussion the discoidal fascia on the underside of the hind wing is broken up into separate spots. A general diagnosis of the male genitalia of the genus *Aloeides* is given by Stempffer (1967 : 174-175) and, as far as the *thyra* complex is concerned, these organs do not furnish any distinctive specific characters; in the remainder of the genus, however, they do in many cases exhibit small differences which, taken in conjunction with external characters, do serve as an aid to identification.

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In the compilation of this work, much generous aid, loan of specimens, and advice has been received from so many people and institutions. The authors wish to express their grateful appreciation to the following: the authorities of the British Museum (Natural History), in particular to Dr P. Freeman, Keeper of Entomology, Mr J. P. Doncaster, and Miss Susan May who is responsible for the drawings of genitalia; the authorities of the Hope Department, University Museum, Oxford, in particular to Professor G. C. Varley; the authorities of the Transvaal Museum, Pretoria, in particular to Dr L. Vari; the authorities of the Naturhistoriska Riksmuseum, Stockholm, in particular to Dr Per Inge Persson; the National Museum of Rhodesia, in particular to Dr Elliot Pinhey; Mr N. A. Brauer of Queenstown, Cape Province; Dr C. B. Cottrell of Salisbury, Rhodesia; Mr A. J. Duke and his son Neville of Salisbury, Rhodesia; Mr W. Henning and his sons

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ABBREVIATIONS

In the lists of paratypes and other specimens studied which follow the descriptions, the depository of the specimens concerned is indicated by the following abbreviations:

BMNH	British Museum (Natural History), Cromwell Road, London, SW7 5BD.
UM, Oxford	University Museum, Parks Road, Oxford.
TM, Pretoria	Transvaal Museum, P.O. Box 413, Pretoria, Republic of South Africa.
NR, Stockholm	Naturhistoriska Riksmuseum, Stockholm 50, Sweden.
NMR, Bulawayo	National Museum of Rhodesia, P.O. Box 240, Bulawayo, Rhodesia.
B.	N. A. Brauer collection.
Henn.	W. Henning collection.
Kr.	D. M. Kroon collection.
McM.	J. C. McMaster collection.
Penn.	K. M. Pennington collection.
Pl.	D. C. H. Plowes collection.
Q.	C. D. Quickelberge collection.
D.	C. G. C. Dickson collection.

KEY TO THE GENERA

1	Spur at the lower extremity of the tibia absent on all legs	2
-	Spur at the lower extremity of the tibia present on the first and second pairs of legs	5
2	(1) Vein 5 of the fore wing arising much nearer the origin of vein 6 than that of vein 4; vein 10 arising far from the origin of vein 7. Large species, the fore wing length between 16 and 26 mm	3
-	Vein 5 of the fore wing arising only slightly nearer the origin of vein 6 than that of vein 4; vein 10 arising near the origin of vein 7. Small species, the fore wing length between 12 and 15 mm	4
3	(2) Vein 7 of the fore wing arising near the junction of vein 6 and the discocellular vein (Text-fig. 1)	<i>PHASIS</i> (p. 231)
-	Vein 7 of the fore wing arising well beyond the junction of vein 6 and the discocellular vein (Text-fig. 9)	<i>TYLOPAEDIA</i> (p. 232)
4	(2) Vein 8 of the fore wing present	<i>POECILMITIS</i> (p. 230)

- Vein 8 of the fore wing absent or but weakly developed **CHRYSORITIS** (p. 230)
- 5 (1) Palpi with a dense fringe of long, dark, pointed hair-like scales along the ventral side of the second segment. Vein 7 of the fore wing arising just before the junction of vein 6 and the discocellular vein; vein 10 arising far from the origin of vein 7 (Text-fig. 11) **OXYCHAETA** (p. 232)
- Palpi smooth, or smooth with a scattering of long, ribbon-like blunt-ended scales (some *Aloeides* only). Vein 7 of the fore wing arising at or beyond the junction of vein 6 and the discocellular vein; vein 10 arising near the origin of vein 7 6
- 6 (5) Vein 7 of the fore wing arising well beyond the junction of vein 6 and the discocellular vein (Text-fig. 13) **ARGYRASPODES** (p. 233)
- Vein 7 of the fore wing arising from or very near the junction of vein 6 and discocellular vein 7
- 7 (6) Vein 5 of the fore wing arising much nearer the base of vein 6 than that of vein 4 (Text-fig. 5) **TRIMENIA** (p. 233)
- Vein 5 of the fore wing arising only slightly nearer the base of vein 6 than that of vein 4 8
- 8 (7) Vein 7 of the fore wing arising just before the junction of vein 6 with the discocellular vein; vein 3 arising before the junction of vein 4 with the discocellular vein (Text-fig. 7) **ARGYROCUPHA** (p. 234)
- Vein 7 of the fore wing arising a long distance before the junction of vein 6 with the discocellular vein; vein 3 arising from the point of junction of vein 4 and the discocellular vein (Text-fig. 3) **ALOEIDES** (p. 235)

POECILMITIS Butler

(Text-figs 15, 16)

Poecilmitis Butler, 1899 : 32. Type-species: *Zeritis lycegenes* Trimen, by original designation. [*Phasis* Hubner; Aurivillius, 1898 : 340, partim.]
 [*Phasis* Hubner; Aurivillius, 1924 : 431, partim.]
Poecilmitis Butler; Stempffer, 1967 : 176.

In addition to the characters mentioned in the key; on the fore wing vein 3 arises a short distance before the cross-vein, and vein 7 originates just before but very close to the cross-vein; on the hind wing vein 3 arises just beyond the cross-vein, vein 5 arises nearer to the origin of vein 6 than to that of vein 4, and vein 7 originates just basad of the cross-vein. The early stages belong to the Clark and Dickson group L. Cross-sections of the larval segments in the Clark and Dickson figures indicate the flattened shape of the larva, and show the affinity of the genus with *Chryсоритис* and *Oxychaeta*, and its wide separation from all other genera here dealt with. As far as they are known, the larvae are vegetarian feeders, but are attended by ants. The life-histories of *P. lycegenes* and numerous other species are given by Clark & Dickson (1971).

CHRYSORITIS Butler

Chryсоритис Butler, 1898 : 848. Type-species: *Zeritis oreas* Trimen, by original designation. [*Phasis* Hübner; Aurivillius, 1898 : 340, partim.]
 [*Phasis* Hübner; Aurivillius, 1924 : 431, partim.]
Chryсоритис Butler; Stempffer, 1967 : 179.

In the fore wing, vein 9 is either absent or very weak. In all other respects the characters are the same as those of *Poecilmitis*, and it is doubtful if the two can be retained as separate genera.

PHASIS Hübner

(Text-figs 1, 2)

Phasis Hübner, 1819 : 73. Type-species: *Papilio salmoneus* Cramer [= *Papilio thero* L.], by subsequent designation (Scudder, 1875 : 247).

Phasis Hübner; Aurivillius, 1988 : 340, partim.

Phasis Hübner; Aurivillius, 1924 : 424, partim.

Pseudocaps Murray, 1935 : 106. Type-species: *Papilio salmoneus* Cramer [= *Papilio thero* L.], by original designation on the unjustified assumption that *Papilio pierus* Cramer was the type-species of the genus *Phasis*.

Palpi with the second segment adorned with long, blunt-ended, ribbon-like scales. *Antennae* fairly short, about half the length of the costa of the fore wing, dark brown in colour and tipped with orange.

Wings. The fore wing distal margin is strongly produced at vein 5, and concave between that vein and vein 2. The hind wing is slightly produced at vein 5 and then concave to vein 2, with a short tail at vein 2 and another at vein 1.

The *early stages* fall into the Clark and Dickson group E, the larvae being attended by ants, but are vegetarian feeders.

SPECIES OF *Phasis*

Phasis thero (L.)

Papilio thero L., 1764 : 328, Cape.

Papilio rumina Drury, 1773 : pl. 2, fig. 1.

Papilio salmoneus Cramer, 1781 : 99, pl. 341, figs D-E, Cape of Good Hope.

Papilio erosine Fabricius, 1787 : 51, Cape of Good Hope.

Papilio pulsus Herbst, 1793 : pl. 156, figs 6-7.

Phasis thero (L.) Clark & Dickson, 1971 : 193-197, pl. 93, figs 1-5. [Life-history.]

Phasis clavum Murray

Phasis clavum Murray, 1935 : 104. Holotype ♂, CAPE PROVINCE: Nieuwoudtville Mts (TM, Pretoria).

Phasis clavum Murray; Clark & Dickson, 1971 : 201-204, pl. 95, figs 8-9, 11-12. [Life-history].

Phasis braueri Dickson

Phasis braueri Dickson, 1968b : 267, pl. 15. Holotype ♂, CAPE PROVINCE: Queenstown (BMNH) [examined].

Phasis braueri Dickson; Clark & Dickson, 1971 : 197-201, pl. 94, figs 1-22. [Life-history].

TYLOPAEDIA gen. n.(Gr. *τυλό*-knobbed, *παεδια*-child)

(Text-figs 9-10)

Type-species: *Zeritis sardonyx* Trimen.

Palpi smooth, the second segment covered with scales of uniform length. *Antennae* short, less than half the length of the fore wing costa; they are dark brown in colour, of somewhat lighter hue below.

Wings differ from those of *Phasis* in shape as follows: the fore wing distal margin is only slightly produced at vein 5; the hind wing has a distinct tooth at vein 4, and another at vein 1, the margin between them being slightly concave, and crenulate.

Early stages. These were placed by Dickson and Clark in their group F. From their figures, it would appear likely that they might better be placed in a separate group; the flattened egg, and the club-like form of the dorsal setae in the young larva render them unlike any of the other members of group F, all of which are *Aloeides*.

Aurivillius placed *sardonyx* in his *Phasis* subgenus *Poecilmitis*, but it is surely more nearly related to *Phasis thero*; its size, shape, venation, and larval characters all confirm this.

SPECIES OF *Tylopaedia****Tylopaedia sardonyx*** (Trimen) comb. n.

Zeritis sardonyx Trimen, 1868 : 83, pl. 5, fig. 5, pl. 6, figs 6-7. Holotype ♂, CAPE PROVINCE: Murraysburg (BMNH) [examined].

Phasis sardonyx ab. *peringueyi* Aurivillius, 1924 : 430, CAPE PROVINCE.

Phasis sardonyx peringueyi Aurivillius; Dickson, 1969b : 213, pl. 9. [Alteration of status].

Phasis sardonyx f. *knobeli* van Son, 1959 : 56, CAPE PROVINCE.

Phasis sardonyx (Trimen) Clark & Dickson, 1971 : 204-208, pl. 96, figs 1-4. [Life history].

OXYCHAETA gen. n.(Gr. *ὀξύς*-pointed, *χαττη*-hair)

(Text-figs 11-12)

Type-species: *Phasis dicksoni* Gabriel.

Palpi. The second segment is furnished with a dense covering of long sharply pointed hair-like scales, these scales being very different in shape from the flattened blunt-ended ones to be found in the same situation in *Phasis*.

Antennae short, less than half the length of the fore wing costa.

Wings. The fore wing is rather long, its apex obtuse, and its distal margin evenly convex; vein 3 arises from the median vein a long way before the cross-vein, and vein 5 arises considerably nearer to vein 6 than to vein 4. The rounded hind wing is without tails or tornal projections; vein 3 arises only a short way before the cross-vein, and vein 5 arises approximately mid-way between the origins of veins 4 and 6.

Early stages. The flattened shape of the larva suggests some affinity with *Poecilmitis*. It belongs to the Clark and Dickson group M.

SPECIES OF *Oxychaeta****Oxychaeta dicksoni* (Gabriel) comb. n.**

Phasis dicksoni Gabriel, 1947 : 60. Holotype ♂, CAPE PROVINCE: Near Melkbosch Strand (BMNH) [examined].

Phasis dicksoni Gabriel; Clark & Dickson, 1971 : 189-193, pl. 92, figs 1-4, pl. 95, figs 3-10. [Life history].

ARGYRASPODES gen. n.

(From *argyraspis* and Gr. *ωδης* - having the form of)

(Text-figs 13, 14)

Type-species: *Zeritis argyraspis* Trimen.

Palpi smooth, the scales on the second segment are of equal length. *Antennae* brown in colour, long, over half the length of the fore wing costa.

Wings. The fore wing distal margin is produced at vein 5, and slightly produced at vein 2 on the hind wing, veins 1 and 2 are produced, the margin between vein 2 and vein 4 being concave.

Early stages. These are not included in Clark and Dickson's classification.

SPECIES OF *Argyraspodes****Argyraspodes argyraspis* (Trimen) comb. n.**

Zeritisa agyraspis Trimen, 1873 : 114. Syntypes, CAPE PROVINCE: between Somerset E. and Murraysburg (*J. H. Bowker*), 1 ♂ (BMNH); Murraysburg (*Mushett*), 1 ♂ (BMNH); Burghersdorp (*Kannemeyer*), 1 ♀ (depository unknown); Beaufort W. (*E. L. Layard*), sex unknown (depository unknown) [BMNH syntypes examined].

Phasis argyraspis f. *labuschagnei* van Son, 1959 : 57. Holotype ♂, BOTSWANA: Nossob River Bed, 10 miles N. of Twee Rivieren, Kalahari Gemsbok National Park, 11-20.ii.1958 (*G. van Son*) (TM, Pretoria).

TRIMENIA gen. n.

(Text-figs 5-6)

Type-species: *Zeritis wallengreni* Trimen.

Palpi smooth as in previous genus. *Antennae* long.

Wings. The fore wing distal margin is angled at vein 5, and concave from that point to the tornus. The tornus of the hind wing is produced, and in some examples there is a tooth at vein 2. On the fore wing, vein 3 arises a long way before the discocellular vein; vein 7 arises just beyond the origin of vein 6; vein 10 arises nearer to the origin of vein 7 than in that of any other genus under review. On the hind wing, vein 3 arises only a short distance before the discocellular vein; vein 5 arises near to vein 6 than to vein 4.

Early stages. These are not included in Clark and Dickson's classification.

SPECIES OF *Trimenia****Trimenia wallengreni* (Trimen) comb. n.**

Zeritis wallengreni Trimén, 1887 : 192. Holotype ♂, CAPE PROVINCE: Stellenbosch (BMNH) [examined].

Phasis wallengreni (Trimén) Clark & Dickson, 1971 : 208–209, pl. 97, figs 1–4. [Life-history].

***Trimenia argyroplaga argyroplaga* (Dickson) comb. n.**

Phasis argyroplaga Dickson, 1967b : 268. Holotype ♂, CAPE PROVINCE: Karroo Hills between Matroosberg (formerly Triangle) Railway Station and Eendracht (BMNH) [examined].

Phasis argyroplaga Dickson; Clark & Dickson, 1971 : 209–212, pl. 98, figs 1–6. [Life-history].

***Trimenia argyroplaga wykehami* (Dickson) comb. n.**

Phasis argyroplaga wykehami Dickson, 1969a : 285. Holotype ♂, CAPE PROVINCE: Summit of Nieuwveld Mts, near Beaufort West (BMNH) [examined].

***Trimenia macmasteri* (Dickson) comb. n.**

Phasis macmasteri Dickson, 1968a : 89. Holotype ♂, CAPE PROVINCE: Vlekpoort, near Hofmayr (BMNH) [examined].

ARGYROCUPHA gen. n.

(Gr. *αργυρος* – silver, *κουφος* – light)

(Text-figs 7–8)

Type-species: *Cigaretis malagrida* Wallengren.

Palpi smooth. *Antennae* just over half the length of the fore wing costa.

Wings. Margins slightly crenulate, with feeble projections at veins 1 and 2 on the hind wing. In addition to the characters mentioned in the key, vein 5 of the hind wing arises much nearer to the origin of vein 6 than to that of vein 4.

Early stages. These belong to the Clark and Dickson group C.

SPECIES OF *Argyrocupha****Argyrocupha malagrida malagrida* (Wallengren) comb. n.**

Cigaretis malagrida Wallengren, 1857 : 43. Holotype ♂, 'Caffraria' (recte Cape Peninsula) (NR, Stockholm).

Phasis malagrida (Wallengren) Clark & Dickson, 1971 : 212–213, pl. 99, figs 1–8. [Life-history].

***Argyrocupha malagrida paarlensis* (Dickson) comb. n.**

Phasis malagrida paarlensis Dickson, 1967b : 123. Holotype ♂, CAPE PROVINCE: Paarl Mountain (BMNH) [examined].

***ALOEIDES* Hübner**

(Text-figs 3, 4)

Aloeides Hübner, 1819 : 73. Type-species: *Papilio pierus* Cramer, by subsequent designation (Scudder, 1875: 107).

[*Phasis* Hübner; Aurivillius, 1898 : 337, partim.]

[*Phasis* Hübner; Aurivillius, 1924 : 424, partim.]

[*Phasis* Hübner; Murray, 1935 : 113, partim.]

Aloeides Hübner; Stempffer, 1967 : 173, partim.

Aloeides Hübner; Tite & Dickson, 1968 : 371.

Palpi. The second segment is smooth with scales of equal length, or, in some species, with a scattering of long, flattened, ribbon-like scales.

Antennae approximately half the length of the fore wing costa.

Wings. The fore wing distal margin is evenly convex, without an obvious projection at vein 5. The hind wing is oval in shape, its margin crenulate; in certain species the tornus is noticeably produced at vein 1 and sometimes at vein 2, but there is never a true tail.

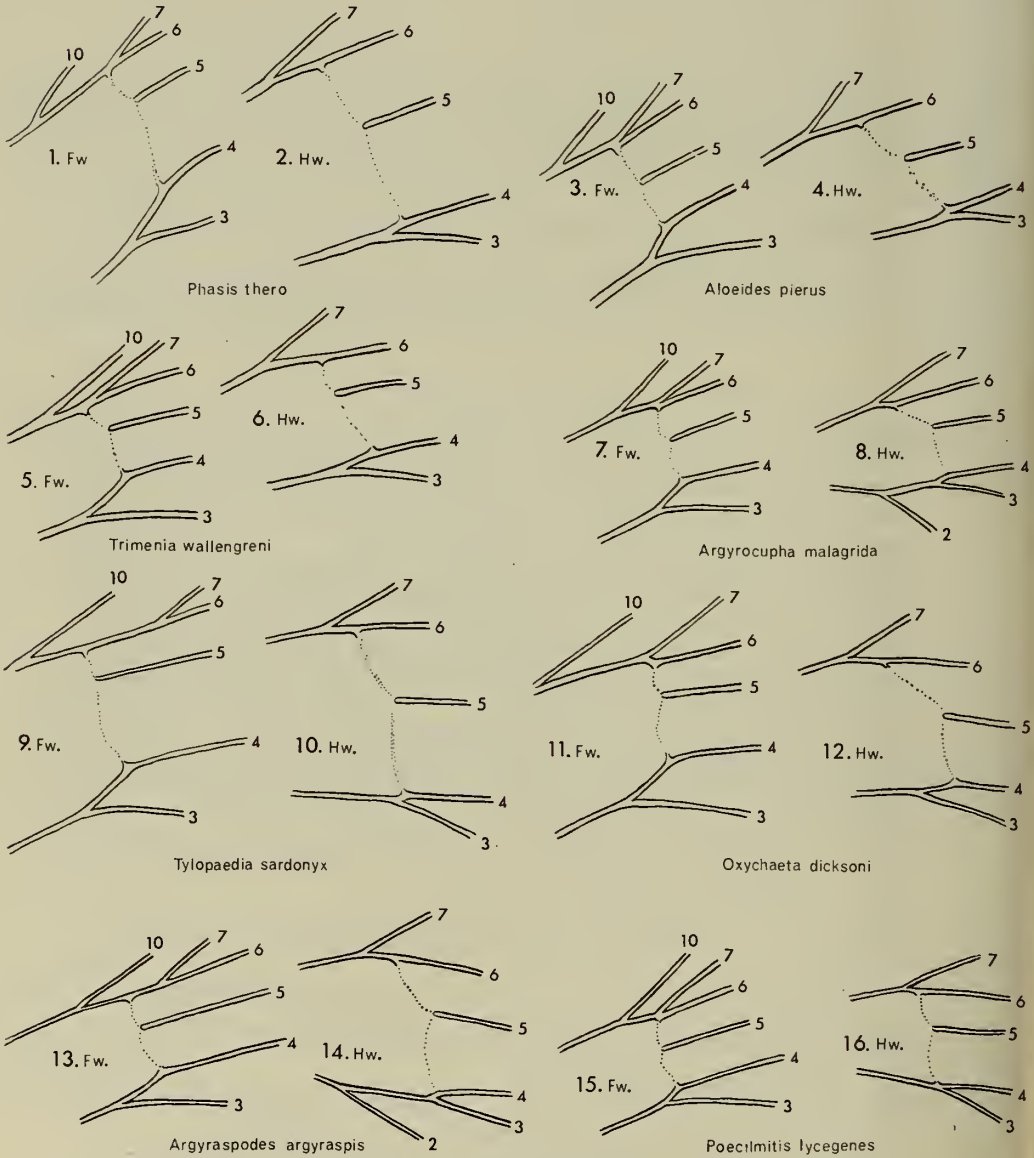
Early stages. Clark and Dickson group F. As far as is known, the larvae are vegetarian though attended by ants, *A. dentatis* being a possible exception (see p. 274).

KEY TO THE SPECIES

- 1 Aedeagus externally smooth without patches of numerous recurved hooks (Text-fig. 17). Upperside of wings bright tawny orange with black-brown borders, and a large black-brown apical patch on the fore wing. Underside of hind wing often with a cloudy dark band placed just distally to the median series (Pl. 1, figs 33-41, 43-46, 52-60, 62-65) . . . *molomo* (p. 239)
- Aedeagus externally with one or two patches of numerous recurved hooks. Upperside of wings tawny orange with black-brown borders, or completely dark brown or grey-brown, or mainly leaden silver. Underside of hind wing without a cloudy dark band placed distally to the median series . . . 2
- 2 (1) Upperside of wings mainly leaden silver, in the female with a subapical orange patch on the fore wing (Pl. 1, figs 48-49) . . . *barklyi* (p. 243)
- Upperside of wings tawny orange with dark borders, ochreous with dark borders, or completely dark brown or grey-brown . . . 3
- 3 (2) Upperside of wings usually tawny orange with black-brown borders, in some males the tawny orange may be absent . . . 4
- Upperside of wings in the males at least mainly grey-brown or warm red-brown, in some cases with obscure straw or ochreous areas in the submarginal region. Never tawny orange in the male . . . 5
- 4 (3) Underside of hind wing with the median series consisting of conjoined spots which form a serpentine or zig-zag band, which usually coalesces with the discoidal fascia . . . *thyra* group (Tite & Dickson, 1968 : 367-388)
- Underside of hind wing with the median series consisting of well separated spots, which do not coalesce with the discoidal spots . . . 10
- 5 (3) Apex of fore wing in the ♂ acute . . . 6
- Apex of fore wing in the ♂ less acute. Upperside of ♂ mainly dark brown. Upperside ♀ as in ♂, but in some cases with tawny orange markings . . . 7
- 6 (5) Upperside of wings washed with straw or tawny yellow in the ♂ (Pl. 1, fig. 50; Pl. 2, figs 71, 73). Upperside of wings tawny orange with dark margins and apical patch in the ♀ (Pl. 1, figs 42, 47, 51; Pl. 2, fig. 72). From Central and East Africa only . . . *conradsi* (p. 245)

Upperside of wings mainly dark brown, but peppered with ochreous scales, some individuals with pale orange-yellow areas in the outer portions of all wings; fore wings in both sexes with a series of four dusky median spots situated in areas 2, 3, 4, and 5 (Pl. 2, figs 74, 83). (Such spots are not present in any other member of the genus.) Only known from Angola

angolensis (p. 249)



FIGS 1-16. Part of the wing-venation of *Aloeides* and allied genera. (Fw = fore wing, Hw. = hind wing).

- 7 (5) Upperside of wings warm red-brown with a velvety texture (Pl. 3, fig. 108).
 ♀ unknown *stevensoni* (p. 250)
 Upperside of wings ♂ dark brown with a non-velvety texture. ♀ as in ♂,
 but in some cases with tawny orange areas 8
- 8 (7) Upperside of wings in both sexes dull dark brown (Pl. 2, figs 75, 76). Underside
 of fore wing grey-brown, never tawny orange (Pl. 2, figs 92, 93) *griseus* (p. 251)
 - Upperside of wings in ♂ dull dark brown with obscure pale submarginal spots.
 ♀ as ♂, but often with tawny orange areas. Underside of fore wing in both
 sexes mainly tawny orange 9
- 9 (8) Upperside of fore wing with the uppermost pale submarginal spot not directed
 towards the apex (Pl. 2, figs 77, 78). Underside of fore wing with the spot
 in the median series in area 2 placed only slightly nearer the margin than is
 the double spot in area 1; in many examples the median spots in areas 1, 2, 3,
 and 4 are placed in a straight diagonal line (Pl. 2, figs 94, 95). Underside
 of hind wing with a definite spot pattern, but never so strongly marked
 as in *plowesi* *taikosama* (p. 251)
 - Upperside of fore wing with the uppermost pale submarginal spot directed
 outwards towards the apex (Pl. 2, figs 79, 80). Underside of fore wing
 with the spot of the median series in area 2 placed immediately below the
 spot in area 3, and much nearer the margin than is the double spot in area
 1; the spots in areas 1, 2, 3, and 4 are never placed in a straight diagonal line
 (Pl. 2, figs 96, 97). Underside of wings very ornate, on the hind wing the
 pattern strongly marked, the spots with silver centres *plowesi* (p. 252)
- 10 (4) Labial palpi with long ribbon-like scales on the ventral portion of the second
 segment *susanae* (p. 253)
 - Labial palpi without long ribbon-like scales on the ventral portion of the
 second segment 11
- 11 (10) Hind wing with tornus not noticeably produced at vein 1. Male genitalia
 with a distinct tooth or projection on the dorsal edge of the clasper 12
 - Hind wing with the tornus noticeably produced at vein 1. Male genitalia
 without a distinct tooth or projection on the dorsal edge of the clasper 15
- 12 (11) Underside of hind wing with the median series broken at vein 3 or vein 4 13
 - Underside of hind wing with the median series variable, but not clearly broken
 at vein 3 or vein 4 14
- 13 (12) Underside of hind wing with the median series broken at vein 3, the spot in
 area 3 being missing or barely indicated (Pl. 2, figs 101-104; Pl. 3, figs 122-124)
 *damarensis* (p. 256)
 - Underside of hind wing with the median series broken at vein 4, the spots in
 areas 4 to 6 being situated far distad of the spots in areas 2 and 3 (Pl. 3,
 figs 127-129) *pierus* (p. 259)
- 14 (12) Upperside of wings with the tawny orange areas in the ♂ sometimes absent,
 and always less in extent than the dark brown areas (Pl. 3, figs 109, 113-117)
 Underside of hind wing with the median series not sharply emphasized
 (Pl. 3, figs 126, 130-134) *trimeni* (p. 260)
 - Upperside of wings with the tawny orange areas always present, and greater
 in extent than the dark brown areas (Pl. 3, figs 118, 119). Underside of hind
 wing with the median series strongly emphasized, often taking the form of
 a continuous band (Pl. 3, figs 135, 136) *swanepoeli* (p. 262)
- 15 (11) Upperside of wings with the tawny orange areas of a deep rich colour.
 Male genitalia with the dorsal edge of the clasper slightly angled 16
 - Upperside of wings with the tawny orange areas of a paler, more yellowish
 tinge (Pl. 3, figs 120, 121; Pl. 4, figs 139-148). Male genitalia with the
 dorsal edge of the clasper rounded, without any angle or tooth (Text-fig. 28)
 *aranda* (p. 264)

- 15 (15) Fore wing in the male short, its apex moderately acute and its distal margin only slightly convex (Pl. 4, figs 149, 150). Male genitalia with the aedeagus having only one patch or recurved hooks situated on the right-hand side (Text-fig. 30) *henningi* (p. 267)
- Fore wing in the male long, its apex moderately obtuse and its distal margin more strongly convex. Male genitalia with the aedeagus having two patches of recurved hooks, one on each side 17
- 17 (16) Fore wing moderately long (Pl. 4, figs 154, 155). From Knysna and more western parts of Cape Province *almeida* (p. 268)
- Fore wing longer and narrower. From the eastern Cape Province *macmasteri* (p. 269)

Aloeides molomo (Trimen)

Superficially, this species shows resemblance to some examples of *A. damarensis*; it differs by its smaller size, and by its wider dark margins on all wings. In all subspecies with the exception of those from Tanzania and Malawi, the underside of the hind wing is characterized by the presence of a cloudy dark transverse band situated between the median series and the submarginal series of spots.

The male genitalia differ from all other members of the genus in the following characters: the aedeagus is externally smooth without patches of recurved hooks, but usually with a strongly sclerotized two- or three-pointed structure on the dorsal surface near the orifice, and with a smaller but similar structure on the left-hand side of the organ (in one example both structures are absent; the preparation appears to be complete, but it is possible that they have been accidentally detached); the clasper is furnished with a point on both the dorsal and the ventral edge, that of all other species having at the most a point or prominence on the dorsal edge only; the juxta is bifid, the two halves each terminating in a point. (Text-fig. 17j.)

KEY TO THE SUBSPECIES

- 1 Underside of hind wing with the cloudy dark band in the median area heavily marked 2
- Underside of hind wing with the cloudy dark band in the median area but feebly indicated 5
- 2 (1) Underside of fore wing with the submarginal spots rounded and well separated 3
- Underside of fore wing with the submarginal spots elongate and tending to coalesce, giving the appearance of a continuous band (Pl. 1, figs 57, 58). (Rhodesia) *m. coalescens* (p. 241)
- 3 (2) Upperside of all wings rich tawny orange (Pl. 1, figs 33–35). (Eastern Cape Province; Orange Free State; Transvaal) *m. molomo* (p. 239)
- Upperside of all wings pale tawny orange 4
- 4 (3) Upperside of fore wing with the distal band narrow, approximately 2 mm in width at vein 3 (Pl. 1, figs 36, 37) (N. W. Cape Province; Botswana) *m. krooni* (p. 240)
- Upperside of fore wing with the distal band wide, approximately 3 mm in width at vein 3 (Pl. 1, figs 40, 41). (Only known from Mumbwa, Zambia) *m. mumbuensis* (p. 241)
- 5 (1) Upperside of fore wing with the apical patch and distal band very extensive, the latter approximately 5 mm in width at vein 3 (Pl. 1, figs 43, 44). (Tanzania) *m. kiellandi* (p. 242)

Aloeides molomo molomo (Trimen)

(Pl. 1, figs 33-35 and 52-54; Text-figs 17a, j, and c)

Zeritis molomo Trimen, 1870 : 373, pl. vi, fig. 9. Holotype ♀, LESOTHO: Koro Koro (depository unknown).*Zeritis molomo* Trimen; Trimen, 1887 : 205 (partim).*Zeritis molomo* Trimen; Trimen, 1904 : 238, pl. xix, figs 4, 4a, Johannesburg.

Length of fore wing: ♂ 14-16 mm; ♀ 14-17.5 mm.

♂. The upperside is bright tawny orange, this colour extending from the base to the distal band on all wings, and on the fore wing reaching to the basal part of the costa. On the fore wing, the black-brown distal margin is wide, approximately 3 mm at vein 2. The apical patch is large, but usually bisected by three tawny orange dots extending towards the costa; these dots may be quite small, or in some individuals can be so large, that they in fact form a link between the tawny orange area and the costa, only broken by the darkened veins. The apical patch of the hind wing is variable, sometimes stopping short at vein 4, sometimes extending beyond that vein towards the tornus in a series of spots.

♀. Apart from some reduction in the black-brown markings, and the usual difference in shape, this sex is like the male.

♂ ♀. The fringes are strongly chequered. Underside fore wing, the tawny orange ground is shaded to buff at the costal and distal margins; there are three silvery white centred, black ringed spots in the cell, and an indistinct spot in area 2 below the centre cell-spot; the median series is very irregular, the first spot being placed well basad, the second distad, and the fourth even more near the margin; the submarginal series are large, and have a touch of white to each spot inwardly. The marginal dots are present. The underside of the hind wing is sandy brown in colour, and decorated with the usual arrangement of spots. These spots are dull silver in hue, and are ringed narrowly with black; those of the median series are rounded, variable in size, and the second and fourth are placed well distad of the others. Beyond this series is the clouded dusky band mentioned in the key. The submarginal series is scarcely visible.

The whereabouts of Trimen's type of *molomo* is not known, but luckily the original figure is an excellent representation, and leaves no doubt as to the authenticity of the present use of the name. Trimen's action in redescribing *molomo* from Johannesburg specimens, and the labelling of some of them as types was unnecessary; these so-called types cannot be regarded as neotypes in view of the considerable distance of Johannesburg from the type-locality (*International Code of Zoological Nomenclature*, Article 75 (c)).

It has been suggested that the population in Lesotho and the Orange Free State differs from that inhabiting the Johannesburg district and other parts of the Transvaal, but the examples available from the first two localities are far too few to form the basis of any firm decision. It is however worth recording that a male from Ladybrand, O. F. S. is almost identical with the Johannesburg specimen figured by Trimen (1904 : fig. 4); both specimens differ from all other specimens examined from Johannesburg in that their dark margins are narrower and more sharply defined inwardly. The width of the dark margins is a variable character in Transvaal examples, but apart from the original of Trimen's figure 4, all his Johannesburg specimens, and the majority of other Transvaal examples studied, are of the wide banded form. On the other hand, of five males from Fairview Mine near Barberton sent by Mr Plowes, three are of the narrow and two are of the wide margined form, proving that in some areas at least both forms

fly together. This question can only be finally settled when much more material is examined from all the localities concerned, and it is not intended at this time to attempt to designate a neotype. In the meantime, examples from all these areas can be considered as *molomo molomo*, the nominate locality being Koro Koro, Lesotho. Specimens from the eastern Cape Province (Queenstown, Cathcart and Klipplaat) are of the narrow bordered form like those from Ladybrand.

MATERIAL EXAMINED.

ORANGE FREE STATE: Ladybrand, xi. 1951 (*D. A. Swanepoel*), 1 ♂, 1 ♀ (BMNH); Hebron, 7.x.1945 (*A. L. Evans*), 2 ♂, 1 ♀ (TM, Pretoria); Sasolburg, ix-x. 1969 (*D. M. Kroon*), 3 ♂, 1 ♀ (Kr.). CAPE PROVINCE: Kimberley, 1898 (*C. Barber*) ex Trimen Coll., 1 ♂, 1 ♀ (BMNH); Cathcart, 1966 (*J. C. McMaster*), 3 ♂, 2 ♀ (McM); Queenstown, x. 1963 (*R. J. Southey*), 5 ♂, 3 ♀ (TM, Pretoria); Klipplaat, 6.iii. (*G. C. Clark*), 1 ♂ (TM, Pretoria). NATAL: Mt Ngwibi, ix. 1915, 2 ♀ (TM, Pretoria). TRANSVAAL: Johannesburg, 1898 (*C. Barber*) ex Trimen Coll., 1 ♂ (BMNH); Johannesburg, 1901-1902 (*Feltham*) ex Trimen Coll., 3 ♂, 1 ♀ (BMNH); Johannesburg, ex Distant Coll., 2 ♂, 3 ♀ (BMNH); Witwatersrand Hills, Johannesburg, 12.x.1902 (*Feltham*) ex Trimen Coll., 1 ♂, 3 ♀ (BMNH); Pietersburg, ii. 1947 (*Swanepoel*), 1 ♀ (BMNH); Struben's Valley, Florida, 1963-7 (*Henning*), 3 ♂, 3 ♀ (BMNH); Fairview Mine, Barberton, 12.x.1961 (*Plowes*), 5 ♂ (Pl.); Malta, x. 1965 (*Brauer*), 1 ♂, 1 ♀ (B); Johannesburg (*Ross*), 1 ♂, 1 ♀ (TM, Pretoria); Doornfontein, Potchefstroom District, 27.ix.1952 (*van Son*), 1 ♀ (TM, Pretoria); Muldersdrift, x. 1949 (*van Son*), 1 ♂, 1 ♀ (TM, Pretoria); Groenebloom, ix. 1951 (*H. Cookson*), 5 ♂ (TM, Pretoria); Rhenoster Kopje, Klerksdorp District, 2.x.1951 (*H. Cookson*), 1 ♂ (TM, Pretoria); White Heather Mine, 14.xi.1938 (*van Son*), 1 ♀ (TM, Pretoria); Wolkberg, 29.ix.1940 (*Swanepoel*), 1 ♀ (TM, Pretoria); Potgietersrust, xi. 1902 (*Burn*), 1 ♀ (TM, Pretoria).

Aloeides molomo krooni subsp. n.

(Pl. 1, figs 36, 37, 55 and 56)

Length of fore wing: ♂ 13 mm; ♀ 14-15 mm.

♂. The upperside on all wings is paler in colour than in any other race; the dark margins are narrower, and the apical patch on the hind wing does not extend below the middle of area 5. On the fore wing, the tawny orange penetration of the apical patch forms a narrow finger-like projection, only weakly divided by a sparse scattering of dusky scales along the veins.

♀. Except for wing shape as in the male. The penetration of the apical patch is wider and the veins crossing it are not usually darkened.

♂ ♀. In contrast with the nominate race, the coloration of the underside is very much paler; the marginal areas of the fore wing and the ground colour of the hind wing are of a light sandy yellow hue. On the hind wing, the silver-white spotting is rendered somewhat obscure by lack of contrast with the pale ground. The cloudy transverse band is also rather less obvious.

Slightly smaller than *molomo molomo*, this race has all the appearance of being a product of the arid areas in which it lives. The above name is proposed as some recognition of the help and encouragement given by Dr D. M. Kroon of Sasolburg.

Holotype ♂, CAPE PROVINCE: Kuruman, 21-9.xi.1923, ex Cator Coll., B.M. Type No. Rh. 17216.

Paratypes. CAPE PROVINCE: Kuruman, 21-9.xi.1923, ex Cator Coll. (allotype ♀, B.M. Type No. Rh. 17217); data as allotype 2 ♂, 2 ♀ (BMNH); Upington, 14.iii.1950 (*Kettlewell*), 1 ♂ (BMNH); Dingle, 10.x.1946 (*Pennington*), 2 ♂ (TM, Pretoria); Kuruman, 8.iv.1933 (*van Son*); Tsabong, 15.xii.1955 (*Pennington*), 1 ♀ (TM, Pretoria). BOTSWANA: Ghanzi (*Maurice*) 3 ♂, 1 ♀ (BMNH); Machudi Station, 3,100' 22.ix.1905 (*Dixey*), 1 ♂ (UM, Oxford); Okavango Swamp, Near Mann, Ngamiland, 3,000', 5.i.1931 (*Hale-Carpenter*), 1 ♀ (UM, Oxford); Nkate, Makarikari, 6-23.viii.1930 (*V. L. Kalahari Expedition*), 5 ♂, 3 ♀ (TM, Pretoria).*

Aloeides molomo coalescens subsp. n.

(Pl. 1, figs 38, 39, 57, and 58)

Length of fore wing: ♂ 14-15 mm; ♀ 15-17 mm.

♂. Very similar to that sex of *molomo molomo*; on the upperside the margins are wide, and in many individuals the apical patch of the hind wing is continued as a band to the tornus. The penetration of the apical patch is more obvious, being broken only by the darkened veins. The underside differs in the formation of the submarginal series of spots on the fore wing; whereas in the nominate race these spots are rounded and well separated, those of *coalescens* are elongate and tend to coalesce, giving the appearance of a continuous band.

♀. Apart from wing-shape, and some reduction in size of the apical patch on the fore wing, this sex is similar to the male.

Holotype ♂, RHODESIA: Umtali, ix. 1929 (*D. R. Sheppard*) B.M. Type No. Rh. 17218.

Paratypes. RHODESIA: Umtali, x. 1937, Jackson Coll. (allotype ♀, B.M. Type No. Rh. 17219); Odzani, x. 1938, Jackson Coll., 1 ♂ (BMNH); Rusape, ix. 1941, 1 ♂ (NMR, Bulawayo); Odzani, 17.x.1931 (*Sheppard*), 1 ♂ (NMR, Bulawayo); Odzani, 2.x.1938 (*Barnes*), 1 ♀ (NMR, Bulawayo); Mt Selinda, xi-xii. 1938 (*Stevenson*), 1 ♂ (NMR, Bulawayo); Macheke, 4.ix.1962 (*Plowes*), 6 ♂, 1 ♀ (Pl.); Headlands, 5.ix.1962 (*Plowes*), 1 ♀ (Pl.); Umtali, 9.x.1938 (*Pennington*), 1 ♀ (TM, Pretoria).

Aloeides molomo mumbuensis Riley

(Pl. 1, figs 40, 41, 59, and 60)

Aloeides molomo mumbuensis Riley, 1921 : 250, pl. 7, figs 3-6. Holotype ♂, ZAMBIA: Mumbwa, 1.ix.1913 (*H. C. Dollman*) (BMNH) [examined].

Length of fore wing: ♂ 13-14 mm; ♀ 14-15 mm.

This race has some affinity with *molomo krooni*, but the dark borders on all wings are much wider, and the apical patch of the hind wing is much more extensive;

* Since going to press, Dr D. M. Kroon has reported taking a series of *A. molomo krooni* at Otavi, South West Africa, on 28.xii.1971. He identified these specimens by comparison with the paratypes in the Transvaal Museum, Pretoria.

it does not however extend below vein 4. The underside colour is paler than that of the nominate race, but less so than in *krooni*.

As far as is known, this subspecies has only been found in the type-locality.

MATERIAL EXAMINED.

ZAMBIA: Mumbwa, 1.ix.1913 (*H. C. Dollman*), 4 ♂, 4 ♀ (BMNH); Mwendwa (recte Mumbwa), 1.ix.1913 (*H. C. Dollman*), 1 ♀ (BMNH).

Aloeides molomo kiellandi Carcasson

(Pl. 1, figs 43, 44, 62, and 63)

Aloeides molomo kiellandi Carcasson, 1961: 19. Holotype ♂, TANZANIA: Wanzizi, Mpanda, vii. 1959 (*J. Kielland*) (BMNH) [examined].

Length of fore wing: ♂ 16–17 mm; ♀ 18–19 mm.

♂ ♀. Differs from all other races by the great width of the distal band on the fore wing, which measures 4.5 mm at vein 2 in the male holotype, and together with the apical patch covers more than half of the wing area. A character not previously mentioned is the presence within the distal band of the fore wing of a series of five tawny orange submarginal spots, situated in areas 2, 3, 4, 5 and 6. The underside of the hind wing is pale brown with reduced dark markings, and with no indication of silver-white spotting. The darker diffuse band which is so obvious in *molomo molomo* is in this race scarcely discernable.

MATERIAL EXAMINED.

TANZANIA: Mpanda, vii. 1959 (*Kielland*), 1 ♀ (allotype) (BMNH); Mpanda, 21.ix.1967 (*Kielland*), 3 ♂ (BMNH); Mwisi, Mpanda, 5–6.viii.1970 (*Kielland*), 1 ♀ (UM, Oxford), 2 ♂ (BMNH); Sitebe, Mpanda, ix. 1970 (*Kielland*), 1 ♂ (UM, Oxford).

Aloeides molomo handmani subsp. n.

(Pl. 1, figs 45, 46, 64, and 65)

Nearest to *A. m. kiellandi* Carcasson, but much darker below and with markings in some respects tending towards *A. m. molomo* Trimen.

Length of fore wing: ♂ 15–16 mm; ♀ 16–17 mm.

♂. The cilia are dark blackish brown above and below, much darker – especially on the hind wing – than are those of *kiellandi*, which itself has darker fringes than any of the other subspecies. The upperside of the fore wing is reddish orange with black markings much as in *kiellandi*, though the distal band is not quite so extended basad as in the holotype of that subspecies; in two males the orange postdiscal series of spots separating the black apical patch from the distal band is obliterated by black scaling. On the upper side of the hind wing, the apical patch is shaped much as in *kiellandi* and *mumbuensis*, but differs in that it extends from the costal margin to just below vein 4, so that all individuals show some kind of black scaling in area 4; two males exhibit in addition a minute spot in area 3, and black antemarginal dots fused to each other as well as to the marginal line. The underside is darker than in any other subspecies. On the fore wing, the costal, apical and marginal areas are coloured as is the hind wing. The remainder of areas 1a to 3 and narrowly along the posterior part of the cell are coloured bright orange; the spots are well developed, being black with dull silvery grey

edging. Apart from a slight lightening of the submarginal area in areas 2 to 5, shown by most specimens, the hind wing surface is of an even tone, thus differing markedly from the alternate dark (basal and postdiscal) and light (discal and marginal) banded appearance of the nominate subspecies or the irregularly marked metallic spotted underside of *mumbuensis*.

♀. As well as the normal dimorphism in wing shape, this sex differs from the male as follows: on the upper side of the hind wing, the antemarginal black dots are not expanded and fused to one another; there is no sign of a brown streak closing the cell as in *kiellandi*; the underside of the hind wing is somewhat lighter, with the submarginal area distinctly lighter as in nominate *molomo*, and differing from *coalescens* in that the median and submarginal series of spots are not close together forming a single dark band, but are separated by a slightly paler area, and in that there is no paler band between the discoidal and the median series of spots.

Holotype ♂. MALAWI: near Ncheu, 28.viii.1965 (J. D. Handman), B.M. Type No. Rh. 17226.

Paratypes. MALAWI: near Ncheu, 28.viii.1965 (Handman), 1 ♀ (allotype B.M. Type No. Rh. 17227) (BMNH), 14 ♂, 4 ♀; Nr Ncheu, 20.ix.1965 (Handman), 6 ♂, 1 ♀; Nr Ncheu, 24.x.1963 (Handman), 1 ♂. (These paratypes are dispersed as follows: in addition to the allotype, 1 ♂, 1 ♀ in BMNH; 5 ♂, 2 ♀ in C. B. Cottrell Coll.; all the remainder in J. D. Handman Coll.)

This subspecies was discovered by Mr J. D. Handman, now of Oranjekrag, O.F.S., and was about to be described by Dr C. B. Cottrell. On hearing that the present paper was in preparation, Dr Cottrell most generously placed the material and a draft description of both this and *Aloeides conradsi angoniensis* (p. 248) at the disposal of the authors, with full permission to include both taxa in this work, the types to be presented to the BMNH.

The following notes are quoted from Dr Cottrell in litt.:

'Male. Expanse (mean \pm S. D. 20 specimens) 31.2 ± 1.95 mm (HT. 33.2 mm.) Female. Expanse (8 specimens) 35.5 ± 0.76 mm. (AT. 35.6 mm.) Male. Antenna wing ratio (mean \pm S. D., 16 specimens) 0.480 ± 0.016 mm. (HT. 0.482); Female Antenna wing ratio (5 specimens) 0.443 ± 0.017 mm.'

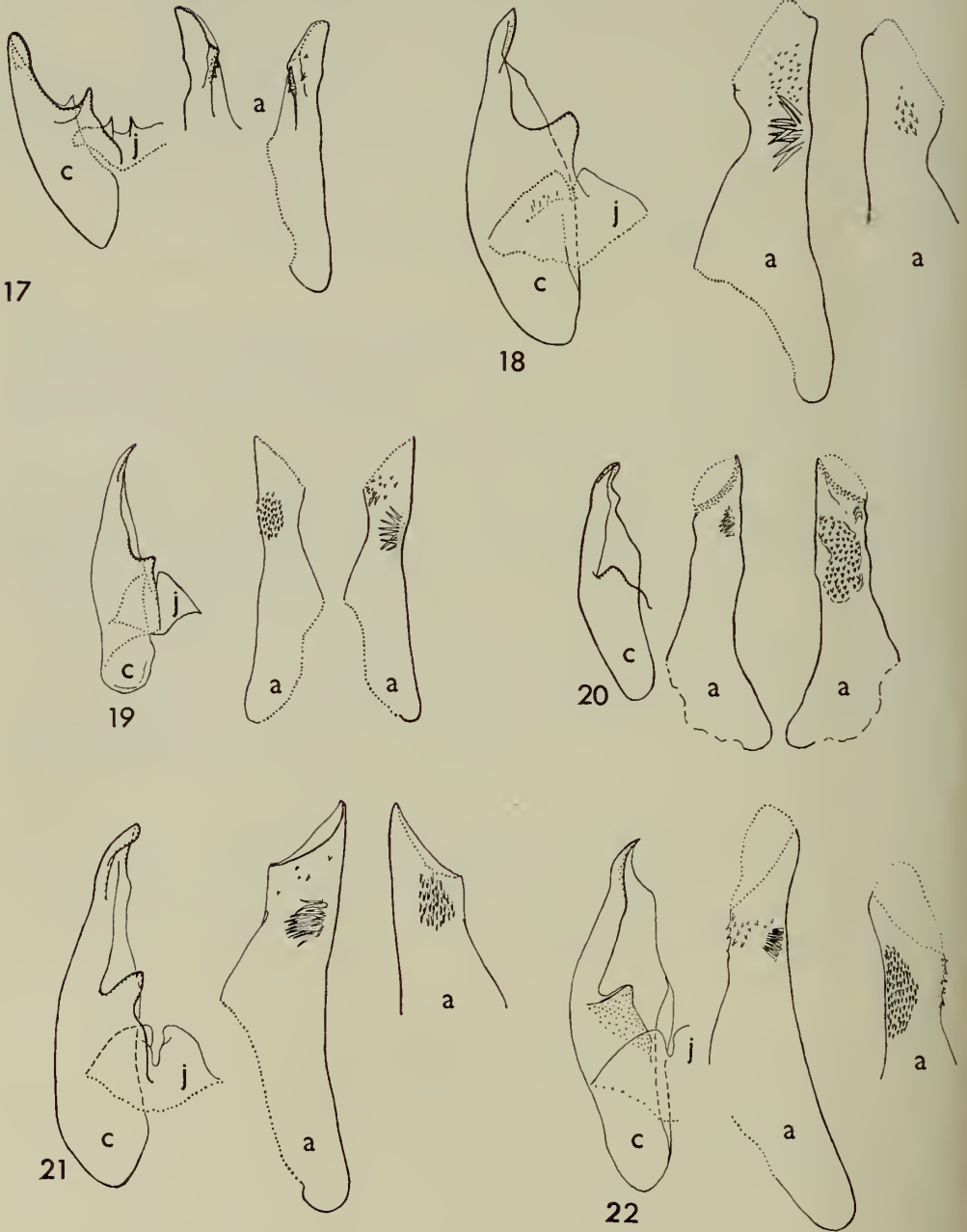
'3 males from the Vipya Plateau also captured by J. D. Handman on 19.ix.'64 are very similar to the Ncheu series but differ in that the *UpH* black costal patch not only extends to *V*₃ but in addition is followed by a series of proximal sub-marginal black dots in *A*₃, 2 and 1c and in that *UpH* ground colour is slightly paler. A similar male was taken (also by J. D. Handman) on the Nyika Plateau on 22.x.1967.'

Aloeides barklyi (Trimen)

(Pl. 1, figs 48, 49, 67, and 68; Text-fig. 18)

Zevitis barklyi Trimen, 1874 : 338. 10 ♂, 3 ♀ syntypes, CAPE PROVINCE: Namaqualand (Trimen) (depository unknown).

Amplification of the characters given in the key is scarcely necessary for the ready identification of this species. Although the general appearance of the underside is characteristic of the genus as a whole, the unique light silvery grey colouring of the upperside separates it immediately from any other *Aloeides*. The superficial resemblance of the female, with its subapical orange patch in the



FIGS 17-22. Male genitalia of *Aloeides*. 17, *A. molomo molomo*; 18, *A. barklyi*; 19, *A. conradsi conradsi*; 20, *A. stevensoni*; 21, *A. angolensis*; 22, *A. griseus* (j = juxta, c = clasper, a = aedeagus, in each case).

fore wing, to some Pierid species of the genera *Anthocaris* or *Teracolus* (*Colotis*) was remarked upon by Trimen himself. The distribution of *barklyi* is now known to be less restricted than when Trimen first discovered the butterfly well to the north in Little Namaqualand in August 1873. Dr P. R. D. Drysburgh has drawn attention to the fact that specimens that were found by him to the south-west of Clanwilliam differ slightly from Namaqualand examples in having a more dusky suffusion on the upperside. This also applies to a single female which was taken by Mr C. W. Wykeham between Koekenaap and Nieuwerust in September 1966. In spite of the protective nature of the underside colouring and pattern, the butterfly can be remarkably alert when settled on the ground with folded wings, and frequently rises unexpectedly when approached, to fly rapidly for a short distance before settling again.

The male genitalia are of the most usual form found in the genus, having a projection on the dorsal edge of the clasp, an aedeagus with two exterior patches of recurved hooks, a group of strong cornuti in the vesica, and a bifid juxta with rounded lobes.

MATERIAL EXAMINED.

CAPE PROVINCE: Kamieskroon, ix. 1950 (*Swanepoel*), 5 ♂, 2 ♀ (BMNH); Springbok, ix. 1950 1 ♂ (BMNH); Clanwilliam, 1 ♂ (BMNH); without definite data, 5 ♂, 2 ♀ (BMNH); Springbok, x. 1946 (*Pennington*), 1 ♂ (NMR, Bulawayo); Garies, 1500', ix. 1938 (*R. C. Wood*), 1 ♂, 1 ♀ (UM, Oxford).

Aloeides conradi (Aurivillius)

This has the most northerly habitat of all the species in the genus, and it is the only representative that extends into Kenya. Slight but constant differences serve to distinguish the three subspecies, and further collecting may well produce others.

The males of all the subspecies may be readily identified by their rather narrow, sharply pointed fore wings, and by the dull grey-brown colour of the upperside, which is rarely more than feebly touched with nebulous pale straw or ochreous spots. The females are usually larger in size than those of *molomo molomo*, and their colour above is less clear in tone. The apical patch and distal band are wide, and a scattering of dark scales of individually variable intensity extends along the veins. In some cases, this scattering is very heavy, and unites to form a transverse median band on the fore wing; this character being most frequent in the subspecies *angoniensis*.

The underside is very variable both in colour, and in definition of the hind wing spotting. On the fore wing, the ground colour is tawny orange, and the white centred, black ringed spots are arranged much as in *molomo*. The costal and distal margins of the fore wing, and the entire hind wing varies individually through various shades of buff to deep pink, the spotting on the hind wing being of a deeper shade of the ground colour with lighter centres.

The male genitalia are like those of the preceding species, but are much smaller in proportion to the size of the insect. Usually there are two patches of recurved hooks on the aedeagus, the individual hooks being smaller; in occasional examples, the patch on the left-hand side of the organ is represented by only a few scattered hooks. The dorsal projection on the clasper varies individually in size, but it is always smaller and less pronounced than is that of *barklyi*.

KEY TO THE SUBSPECIES

This key is based entirely on the upperside of the wings. The males of *A. c. talboti* and *A. c. jacksoni* cannot be distinguished on wing-pattern.

- 1 (1) Pale markings absent or vestigial in the male (Pl. 2, fig. 71). Female with the tawny orange areas heavily clouded with dusky scaling; distal band of the fore wing more than 3 mm wide at vein 3 (Pl. 2, fig. 72). (Malawi) *c. angoniensis* (p. 248)
- Pale markings present in the male. Female with the tawny orange areas not heavily clouded with dusky scaling; distal band of the fore wing less than 3 mm wide at vein 3 2
- 2 (1) Pale markings of the male straw-coloured (Pl. 1, fig. 50). Female rich tawny orange in colour (Pl. 1, fig. 51). (Ukerewe) *c. conradsi* (p. 246)
- Pale markings of the male ochraceous. Female pale tawny orange in colour 3
- 3 (2) Female fore wing with the dark distal margin less than 2.5 mm wide at vein 3 (Pl. 1, fig. 47). (West of Rift Valley) *c. talboti* (p. 247)
- Female fore wing with the dark distal margin more than 2.5 mm wide at vein 3 (Pl. 1, fig. 42). (East of Rift Valley) *c. jacksoni* (p. 247)

Aloeides conradsi conradsi (Aurivillius)

(Pl. 1, figs 50, 51, 69, and 70; Text-fig. 19)

Phasis conradsi Aurivillius, 1907 : 3, Holotype ♀, TANZANIA: Ukerewe (depository unknown).

Length of fore wing: ♂, 15–16 mm; ♀, 15.5–19 mm.

♂. On all wings, the upperside is dull brown with pale straw-coloured markings of variable extent; these consist on the fore wing of a discoidal spot and a series of obscure submarginal spots, extending inwards as a pale washing in some examples. The hind wing bears a similar but even more diffuse submarginal series.

♀. The upperside is rich tawny orange, not so clear in tone as that of *molomo*, and with vague scattering of dark scales along the veins. On the fore wing, there is a dusky brown area at the base, a discoidal spot of the same colour, a poorly defined median band extending from the shadowy apical patch, and followed by a marginal band of approximately 2.5 mm in width at vein 3.

MATERIAL EXAMINED.

TANZANIA: Ukerewe (various collectors), 17 ♂, 18 ♀ (BMNH); Itigi, 150 miles east of Tabora, iii-iv. 1917 (*Hale-Carpenter*), 19 ♂, 16 ♀ (UM, Oxford); Old Shinyanga, 22.ii.1935 (*E. Burt*), 1 ♂, 1 ♀ (UM, Oxford); Dodoma, 30.xii.1965 (*Kielland*), 1 ♂, 1 ♀ (BMNH); Ibwaga near Kongwa, iii-iv. 1917 (*Rogers*), 12 ♂, 18 ♀ (UM, Oxford).

Aloeides conradsi talboti subsp. n.

(Pl. I, figs 47 and 66)

Phasis conradsi ♂ f. *ochraceous* [sic] Joicey & Talbot, 1924 : 546. Holotype ♂, TANZANIA: District of Great Craters, ii-iii. 1921 (*T. A. Barns*) (BMNH) [examined].

Length of fore wing: ♂ 13-15 mm; ♀ 14-17 mm.

♂. The upperside is similar to that of the nominate subspecies, but the pale markings on all wings are more extensive and, though variable in colour, are always of a more ochraceous or tawny orange tint; the submarginal series on the hind wing is especially deep in colour. Form *ochraceoa* Joicey & Talbot is an extreme example, in which the tawny orange areas on all wings are so extended that the pattern is almost like that of the female.

♀. Only differs above from the nominate subspecies by its paler more yellowish ground colour.

♂ ♀. The underside is identical with that of *conradsi conradsi*.

The possibility that the name *ochraceoa* could be used for this subspecies was considered, and Article 45 of the *International Code of Zoological Nomenclature* consulted. It is well known that the authors concerned recognized the modern use of the terms species, subspecies and form; in fact all three terms appear in the paper in question. In addition, the reference to what they considered the typical *conradsi* from the Ngorongoro Crater in the same area, and the fact that only one example of *ochraceoa* was considered does indicate that the name was published as that of an infrasubspecific taxon for one sex only. It has therefore no subspecific standing. As a matter of fact, there are two female specimens in the BMNH (ex Joicey Coll.) bearing exactly similar data labels as that attached to the type of *ochraceoa*, and obviously collected with it; they do not differ in any way from females from the Ngorongoro Crater. These two insects were certainly in the Joicey collection, and it is surprising that no mention was made of them in the description of *ochraceoa*. These facts obviate the undesirable necessity of using an extreme aberration as the holotype of the subspecies.

Holotype ♂, TANZANIA: Ngorongoro Crater, Arusha District, 5,800', ii. 1921 (*T. A. Barns*), B.M. Type No. Rh. 17222.

Paratypes. TANZANIA: data as holotype, 1 ♀ (allotype, B.M. Type No. Rh. 17223); data as holotype, 15 ♂, 6 ♀ (BMNH); District of Great Craters, ii-iii. 1921 (*Barns*), 2 ♀ (BMNH); Plateau near Mbula, Arusha District, 6,000', iii. 1921 (*Barns*), 1 ♀ (BMNH); north end of Lake Manyara, Arusha District, ii. 1921 (*Barns*), 1 ♀ (BMNH); west shore of lake Manyara, ii-v. 1935 (*B. Cooper*), 1 ♀ (BMNH).

Material excluded from the type-series. KENYA: Upper Kuja Valley, S. Kavirondo, 4'200', v. 1911 (*Neave*), 3 ♂, 8 ♀; Valley of Mirua, S. Kavirondo, 4,500', v. 1911 (*Neave*), 1 ♀; S. Kavirondo, 1931-2 (*van Someren*) 3 ♂, 5 ♀; Kisumu, v. 1947 (*Jackson*), 1 ♂; Port Florence, Kisumu, iv. 1911 (*Neave*), 1 ♀ (all BMNH).

Aloeides conradsi jacksoni subsp. n.

(Pl. I, figs 42 and 61)

Length of fore wing: ♂ 14-17 mm; ♀ 16-20 mm.

♂. Larger in size, but otherwise very similar both above and below to that sex of the preceding subspecies.

♀. Differs from both *c. conradsi* and *c. talboti* females by its greater size, and by the much greater width of the distal band on the fore wing; in most examples this band attains a width of 4 mm at vein 3.

From the material available it is evident that *talboti* occurs to the west, and *jacksoni* to the east of the Rift Valley. The differences between these two subspecies are certainly slight, but they are very evident when a long series of each is compared.

Holotype ♂, KENYA: Nairobi, iv. 1935 (*T. H. E. Jackson*), B.M. Type No. Rh. 17224.

Paratypes. KENYA: Nairobi, iv. 1935 (*Jackson*), 1 ♀ (allotype, B.M. Type No. Rh. 17225) 5 ♂, 3 ♀; Nairobi, 1931-4 (*van Someren*), 12 ♂, 3 ♀; Nairobi, 1905, 4 ♂; Bissel, near Nairobi, 6,000', ii. 1916 (*H. Tytler*), 4 ♂, 8 ♀; Bissel-Mamanga (*van Someren*), 1 ♀ (all BMNH); Nairobi, 5,500', 17.x.1919 (*K. St A. Rogers*), 1 ♀; 15 miles west of Fort Hall, Kikuyu, Weithaga, 6,000', 20.iii.1907 (*St A. Rogers*), 1 ♀ (both UM, Oxford); Kikuyu, iv. 1900 (*Crawshay*), 1 ♂, 1 ♀; Ngong, v. 1947 (*van Someren*), 1 ♂, 2 ♀; Ketiti, Ukamba, 14-16.xi.1896 (*Ansorge*), 1 ♂, 1 ♀; Teita 1 ♂, 1 ♀; Machakos, 15.iv.1898 (*Ansorge*), 1 ♀ (all BMNH); Machakos, Mukan Hills, 10-11.vi.1908 (*St A. Rogers*), 1 ♂, 2 ♀ (UM, Oxford). TANZANIA: Longido West, 1916 (*Tytler*), 1 ♂, 2 ♀; Tabora (various collectors), 3 ♂, 7 ♀ (all BMNH).

Aloeides conradsi angoniensis subsp. n.

(Pl. 2, figs 71, 72, 88 and 89)

Darker and more richly coloured than the nominate subspecies; in the male with the postdiscal band on the upperside of the hind wing, when distinct, almost invariably dark orange rather than greyish yellow; in the female with the orange area of the fore wing upperside usually completely, always partly, separated by black scaling extending inwards from both the costal and inner margins into the post discal and basal orange areas.

♂. The cilia above are dark blackish brown, only narrowly and faintly interrupted by light grey between the veins, most markedly so in areas 1b, 2 and 3 on the fore wing. The upperside fore wing is dark blackish brown with only the faintest (usually scarcely discernible) powdering of light scales between the base of the wing and the region of the discal band; these scales tend to be orange rather than greyish yellow, and when present, are most prominent about the middle of area 1b. A postdiscal series of five light coloured spots is present in areas 2 to 6, those in areas 2 and 3 being longer and having a greater tendency to be orange; in thirteen specimens at least some of these spots are orange; in seventeen (including the holotype) all the developed spots are greyish yellow; in one specimen only, the spots are not visible. On the underside, the cilia are maroon tinted brown with black chequering at the vein ends. The fore wing is slightly darker than that of the nominate race, and the hind wing dark maroon tinted brown with blackish brown spots edged with dull silvery grey.

♀. The cilia above are blackish brown, chequered between the veins with orange-brown just below the apex of the fore wing, and with grey elsewhere. On the upperside of the fore wing, the black scaling which extends between the costal and inner margins is much better developed than in nominate *conradsi*; in areas 1a and 1b it extends outwards to unite with the black distal band, so that the postdiscal orange area does not approach closer to the inner

margin than the interneural fold of area 1b. In six specimens (including the allotype), this black scaling extends without a break from the costa to the inner margin, thus completely cutting off a postdiscal orange band from the basal area; in the remaining three specimens, the black scaling is incomplete in area 3 (one specimen) or in areas 2 and 3 (2 specimens), so that the postdiscal orange area is not completely separated from the basal area. The underside is like that of the male, but the hind wing is of a somewhat deeper maroon colour.

Holotype ♂, MALAWI: Ncheu, 21.xi.1965 (*J. D. Handman*), B.M. Type No. Rh. 17226.

Paratypes. MALAWI: Ncheu, 21.xi.1965 (*Handman*), 1 ♀ (allotype, B.M. Type No. Rh. 17227), 22 ♂, 6 ♀; Ncheu, 14.xi.1965 (*Handman*), 1 ♂, 2 ♀; Ncheu, 25.xi.1962 (*Handman*), 4 ♂; Ncheu, 26.xi.1962 (*Handman*), 1 ♂; Ncheu, 27.xii.1964 (*Handman*), 2 ♂ (7 ♂, 3 ♀ in C. B. Cottrell Coll.; all the remainder in J. D. Handman Coll.); Ncheu, 14-21.xi.1965 (*Handman*), 1 ♂, 1 ♀ (BMNH).

Material excluded from the type-series. ZAMBIA: Isoka, 2.xii.1952 (*C. B. Cottrell*), 2 ♂; Lusaka, 9.x.1955 (*J. A. Cottrell*), 2 ♂; Hills 69 miles from Lusaka on Fort Jameson Road, 27.xi.1963 (*C. B. Cottrell*), 1 ♀. TANZANIA: Mpanda District, vii-viii. 1970 (*J. Kielland*), 17 ♂, 9 ♀ (BMNH); 3 ♂, 3 ♀ (UM, Oxford).

The following notes are quoted from C. B. Cottrell (*in litt.*):

'Male expanse (mean \pm S.D. 31 specimens) 33.3 ± 1.72 mm (holotype 35.6), Antenna - wing ratio (20 specimens) 0.476 ± 0.011 (holotype 0.483). Female expanse (9 specimens) 35.0 ± 2.85 mm (allotype 38.8 mm). Antenna wing ratio (7 specimens) 0.458 ± 0.019 (allotype 0.443).'

Aloeides angolensis sp. n.

(Pl. 2, figs 74, 83, 91 and 100)

Length of fore wing: ♂ 16-17 mm; ♀ 14-16 mm.

♂. Larger than that sex of *damarensis*, the apex of the fore wing far more acute, and the distal margin is straighter. The head and frons are ferruginous; the palpi are smooth, and of the usual *Aloeides* type. The fore wing is dingy fuscous with an ochreous tinge, and is margined distally by a wide - over 2 mm - dusky brown band, which widens to twice its width at the anal angle. A dark margined pale spot closes the cell. In the disc, a series of dusky median spots - four in number - are placed in areas 2, 3, 4 and 5, that in 4 being well distad of those in 3 and 5; they are immediately above their counterparts on the underside, but are in fact definite dark patches and not the result of the underside spots showing through. This character has not been observed in any other member of the genus. The hind wing is coloured as the fore wing, but is brightened with some ochreous scales distally, and is margined by a series of dusky submarginal lunules. The cilia are pale fuscous chequered at the vein ends with rufous and dusky scales. In one example, a clear yellow-orange area occurs on the fore wing, situated between the median series and the distal margin, extending between vein 2 and vein 5. A similar wider area extends from the anal angle to vein 5 on the hind wing.

♀. Apart from wing-shape this sex is very similar to the male; one example exhibits obscure indications of orange areas on the wings as in the aberrant male.

♂ ♀ underside. On the fore wing, all the usual spots are present; those of submarginal series are reduced regularly in size from the anal angle to the apex, those nearest the costa

tending to obsolescence. The spots in the cell and the median series are large, heavily ringed with black, and have intensely white centres. The ground colour is pale orange-yellow, the apex and distal margin being buff-brown, or in some individuals reddish buff-brown. On the hind wing, the colour matches that of the apex and margin of the fore wing; the pale spots are just lighter shade of the same colour, and are finely ringed with darker brown. These spots are positioned much as are those of *damarensis*, but unlike that species they never exhibit a metallic lustre.

The male genitalia are in all respects like those of *damarensis* and the taxon may prove to be a subspecies of that species when more information is available.

Holotype ♂, ANGOLA: Benguella, 26.ix.1904 (*Dr Ansorge*), B.M. Type No. Rh. 17228.

Paratypes. ANGOLA: data as holotype, 1 ♀ (allotype, B.M. Type No. Rh. 17229), 2 ♂, 1 ♀ (BMNH).

Aloeides stevensoni sp. n.

(Pl. 3, figs 108 and 125; Text-fig. 20)

[*Phasis taihosama* (Wallengren); Stevenson, 1957 : pl. 1, fig. 3. Misidentification.]

Through the kindness of Dr Elliot Pinhey and the authorities of the National Museum, Bulawayo, the only known examples of this species were received on loan, together with a number of *Aloeides trimeni* (*taihosama* auct. nec Wallengren) from Inyanga. It was at once apparent that the two specimens concerned were abundantly different from both *trimeni*, and all other species in the genus; their distinctive wing shape, the velvety appearance of their ferrugineous brown wings, and genitalic characters all serve to confirm that view. Stevenson's photographic figure is evidently taken from one of these specimens.

Length of fore wing: ♂ 12 mm.

♂. The fore wing costa is strongly arched, the apex rather obtuse, and the distal margin strongly convex. The rounded hind wing is scarcely produced at all at the tornus. On the upperside, deeper and richer in colour than in *trimeni*, it is deep dark brown with a tinge of ferrugineous; the surface is dense in texture, giving the impression of a velvety appearance. The fore wing is entirely without markings, and on the hind wing the ground colour is only broken by a vague patch of tawny orange scales near the tornus, and a sparse scattering of similar scales in areas 1, 2 and 3. The fringes are grey-buff, without any obvious chequering at the vein ends. On the underside, the pattern is similar to that of *trimeni*, but the colour is deeper, and on the fore wing, the white centred black spots in the cell and median series are rather larger. The spots in the submarginal series are large and well formed, diminishing in size towards the apex. The costal and distal marginal areas are dingy fuscous. On the dingy fuscous hind wing, the median series is only visible as a chain of interneural linear black marks, those in areas 1, 2 and 3 being placed nearer to the base of the wing than are their counterparts in *trimeni*, giving a distinctly rounded appearance to the series as a whole. The usual basal and submarginal series of spots are present, they are blackish, but not strikingly evident. A noticeable rufous brown patch occupies parts of areas 4, 5 and 6 in the subapical region, and a smaller though similar patch is placed near the tornus.

♂ genitalia. All parts are slightly smaller than those of *trimeni*; the aedeagus is without a patch of recurved hooks on the left hand side, but is furnished with a large patch of rather

small hooks on the right. In contrast, *trimeni* has a definite patch of hooks on the left, and a patch of fewer but larger hooks on the right.

♀. Unknown.

Holotype ♂, RHODESIA: Rusape, vi. 1926 (*R. H. R. Stevenson*) (NMR, Bulawayo).

Paratype. RHODESIA: data as holotype, 1 ♂ (BMNH).

Aloeides griseus Riley

(Pl. 2, figs 75, 76, 92 and 93; Text-fig. 22)

Aloeides griseus Riley, 1921 : 251, pl. 7, figs 1, 2. Holotype ♂, ZAMBIA: Solwezi, 22.viii.1917 (*H. C. Dollman*) (BMNH) [examined].

Length of fore wing: ♂ 15–18 mm; ♀ 18–19 mm.

♂. The upperside of all wings is dark grey-brown, with faint golden reflections in certain lights. There is an obscure lighter grey spot at the cell-end of the fore wing, and a barely indicated series of submarginal lunules of similar colour on the hind wing. The fringes are pale grey with darker chequering at the vein ends.

♀. Above, very like the male, but the fore wing exhibits a cloudy submarginal band, light grey in colour, and extending from area 2 to the near vicinity of the costa. The light grey submarginal series of lunules on the hind wing is much more clearly defined.

♂♀. Unlike all other members of the genus, the underside ground colour of the fore wing is not tawny orange; it is in fact pale grey with a distinct yellow tinge, on which the black ringed white centred spots stand out clearly. The costal and distal margins are greyish, the submarginal series being but faintly indicated. On the hind wing the colour is grey, the brownish ringed spots not being strongly in contrast with the ground, and the submarginal series is but faintly indicated.

♂ genitalia. The clasper is larger by one third than that of *taikosama*. The aedeagus has few and scattered hooks on the left-hand side, but a large patch of small closely placed recurved hooks on the right.

At first sight this species has the appearance of a large dark male of *taikosama*, but it can be readily distinguished by the greyish (not orange) colour of the fore wing beneath. Dr C. B. Cottrell (*in litt.*) writing of this insect says 'I have taken this on virtually every spring and early summer visit to the Nyika since 1952. When out it is abundant there. There is a good deal of variation in size, and in the presence of the light greyish-yellow markings above in both males and females, but after carefully comparing Nyika specimens with Dollman's types, I don't think the two are worth separating'.

MATERIAL EXAMINED.

ZAMBIA: Solwezi, 22.viii.1917 (*Dollman*), 1 ♀ (allotype) (BMNH). MALAWI: Nyika Plateau, 7,000', 16–17.ix.1964 (*J. D. Handman*), 1 ♂, 1 ♀ (BMNH).

Aloeides taikosama (Wallengren) **comb. n.**

(Pl. 2, figs 77, 78, 94 and 95; Text-fig. 23)

Cygaritis taikosama Wallengren, 1957 : 43. Holotype ♀, Caffraria (NR, Stockholm) [examined].

Zeritis orthrus Trimen, 1874 : 340, pl. 2, fig. 10, Natal (depository of type unknown). **Syn. n.**

This species has long been known to collectors as *orthrus* Trimen, and the name *taikosama* Wallengren has been used for the species now to be named *trimeni* (p. 260). Through the kind co-operation of Dr Per Inge Persson of the Stockholm Museum, both authors have been enabled to examine the holotype of Wallengren's *Cygaritis taikosama*, and there can be no doubt that it is a female example of the species now under discussion. The necessity of making the change in the long established usage of the name is much regretted. The insect exhibits a wide range of individual variation, but in the large series examined, upwards of two hundred examples, and coming from widely different localities, there is no visible evidence of subspeciation. It inhabits a wide area extending over Natal, Transvaal, Mozambique, Rhodesia and Zambia.

Length of fore wing: ♂ 11-16 mm; ♀ 14-18 mm.

♂ upperside. As in *griseus*, but on the fore wing there is a curved submarginal series of interneural straw-grey blotches, extending from area 2 to near the costa; this series varies in size and definition in different individuals, but is frequently more obvious than the corresponding series in female *griseus*. The submarginal series of straw-grey lunules on the hind wing is in most examples sharply delineated, although specimens do occur in which this series is vestigial or absent altogether. The light grey fringes are rather more definitely chequered than are those of the previous species.

♀ upperside. Dingy brown, of a warmer tone than that of the male, the submarginal series is run together to form an irregular band of varying extent, often with ray-like extensions towards the distal margin, and always of a bright tawny orange colour; in very few examples indeed is this tawny orange band absent. The fringes are like those of the male.

♂ ♀ underside. The fore wing is mainly tawny orange, the silver-white black ringed spotting being very obvious. The hind wing varies in individuals from pale grey-brown to warm reddish brown; the spots are deeper in tone than the ground, and have whitish centres with more or less metallic lustre in certain lights.

♂ genitalia. Very similar to those of *griseus*, but only two-thirds the size.

The butterfly has a wide variety of habitats, some of them in the Karroo, others in grassland or savannah country, or even in the subtropical coastal belt as at Laurenço Marques. The colouring of the underside can vary greatly even in examples from the same locality, some individuals being of a full maroon colour, in contrast to the dull brownish tone of others. In the Great Karroo, the species has been found in the vicinity of Beaufort West in midsummer. It appears to be absent from the country near Cape Town.

Aloeides plowesi sp. n.

(Pl. 2, figs 79, 80, 96 and 97; Text-fig. 24)

Similar in appearance and closely related to *Aloeides taikosama*, this species must frequently have been passed over as *taikosama*; however, it is by no means certain that the two species do in fact fly together, even when both occur in the same district. Dr Cottrell (*in litt.*) points out that there are specimens of *plowesi* labelled as having been taken at Salisbury in both the Bulawayo and the British Museum (Nat. Hist.), yet his own entire series from that place are definitely all *taikosama*. He suggests that there may be a habitat difference, and speaking

of his series says 'these specimens come almost entirely from a colony in the grounds of the University College and since I used often to stop and watch the insects on my way to and from work, I feel pretty sure that *plowesi* really was absent'.

Length of fore wing: ♂ 13-15 mm; ♀ 15-17 mm.

♂ upperside. Confusingly like that of *taikosama*, but differs as follows: the pale submarginal blotch nearest the costa is always present, and is placed slightly distad so that the otherwise convex line of the submarginal series appears to turn towards the apex as it nears the costa. The hind wing does not differ from that of *taikosama*.

♀ upperside. On the fore wing, the tawny orange submarginal series is arranged like that of the male, the costal spot being turned outwards towards the costa; the series consists of larger spots, those in areas 2 and 3 extending inwards in some examples. These submarginal spots never extend outwards towards the margin as is frequently the case in many examples of *taikosama*. On all wings the extent of these tawny orange spots is exceedingly variable.

♂♀ underside. As in *taikosama*, but far more striking; all the spotting is heavier and the colouring richer, giving an altogether more decorative appearance. The black-ringed silver-white-centred spots on the fore wing are large and prominent; the two lower spots of the median series, situated in area 1, are arranged perpendicularly and well inwards of those in areas 2 and 3, never forming a straight diagonal line with them as is frequently the case in *taikosama*. The seventh spot of the series - that nearest the costa - is always placed slightly distad, thus giving the same apical twist as is to be seen on the upperside. On the hind wing, the ground colour is fuscous, laved with reddish brown, the latter colour being especially concentrated near the distal margin and inwards of the submarginal series. The spots of the basal, discoidal and median series are strongly emphasised, brown-ringed and silver-centred; the submarginal series is also heavily marked.

The species is named after Mr D. C. H. Plowes of Umtali as some recognition of his willing aid and advice.

Holotype ♂, RHODESIA: Salisbury, 5.x.1894 (*G. A. K. Marshall*), B.M. Type No. Rh. 17231.

Paratypes. RHODESIA: Salisbury, 2.x.1894 (*Marshall*), 1 ♀ (allotype, B.M. Type No. Rh. 17232); Salisbury, viii-x. 1894 (*Marshall*), 3 ♂ (BMNH); Umchiki River, Mashonaland, 7.xi.1897 (*Marshall*), 1 ♀ (BMNH); Chimanimani, 6.v.1947 (*B. D. Barnes*), 1 ♂ (NMR, Bulawayo); Chimanimani, 12.x.1952 (*K. M. Pennington*), 1 ♂ (TM, Pretoria); Chimanimani, 23.x.1960 (*Plowes*), 6 ♂ (Pl.); Inyanga, 9-17.x.1945 (*Barnes*), 2 ♂, 1 ♀ (NMR, Bulawayo); Inyanga, x. 1945 (*R. C. Cox Coll*), 2 ♂ 1 ♀ (NMR, Bulawayo); Inyanga, 5.x.1958 (*H. Cookson*), 2 ♀ (NMR, Bulawayo); Inyanga, 1962-1968 (*Plowes*), 15 ♂, 12 ♀ (Pl.); Rusape, vi. 1927 (*R. H. R. Stevenson*), 1 ♀ (NMR, Bulawayo); Adam's Ridge, Melsetter, 18.xi.1965 (*Plowes*), 1 ♂ (Pl.); Beaconsfield, Estcourt, 4,000', 19.xi.1949 (*Plowes*), 1 ♂ (Pl.); Umvukwo Hills, 10.v.1962 (*Plowes*), 1 ♂ (Pl.).

Aloeides susanae sp. n.

(Pl. 2, figs 81, 82, 98 and 99; Text-fig. 25)

This species differs from *Aloeides trimeni* by its more convex distal margin, and rounder apex on the fore wing. As mentioned in the key, the presence of

long ribbon-like scales on the second joint of the labial palpi is probably the best means of identification.

Length of fore wing: ♂ 11–15 mm; ♀ 12–15 mm.

♂ upperside. Very variable, the pattern varying from completely dark brown examples to those with quite extensive areas of tawny orange on all wings; in the most extreme examples, the tawny orange covers the basal two-thirds of areas 1, 2 and 3, and extends over the median vein and vein 4, infringing a short way into the cell and area 4. The hind wing varies in a similar manner, the lightest specimen being mainly tawny orange in areas 1 to 3, and the lower part of the cell, this area being only bounded distally by the dark margin and its contiguous submarginal series of blackish spots, and basally by some dusky brown scaling. The remainder of the wing to the costa is dusky brown. On all wings, the fringes are dingy fuscous.

♂ underside. On the fore wing the ground colour is tawny orange, the spots well defined but smaller than those of *trimeni*. The double spot in area 1 is usually situated well inward of the spots in areas 2 and 3. The costal, and distal margins and the fringes are all of matching colour with that of the hind wing, which is dusky buff-brown, often tinged with reddish. The usual spot pattern is present on the hind wing, but as on the fore wing the spots are rather small; the spot-centres are greyish, and show no indication of a metallic lustre such as may be seen in many examples of *trimeni* and *damarensis*.

♀. Apart from wing-shape, this sex scarcely differs from the male on either surface, but entirely dark brown uppersides are rare.

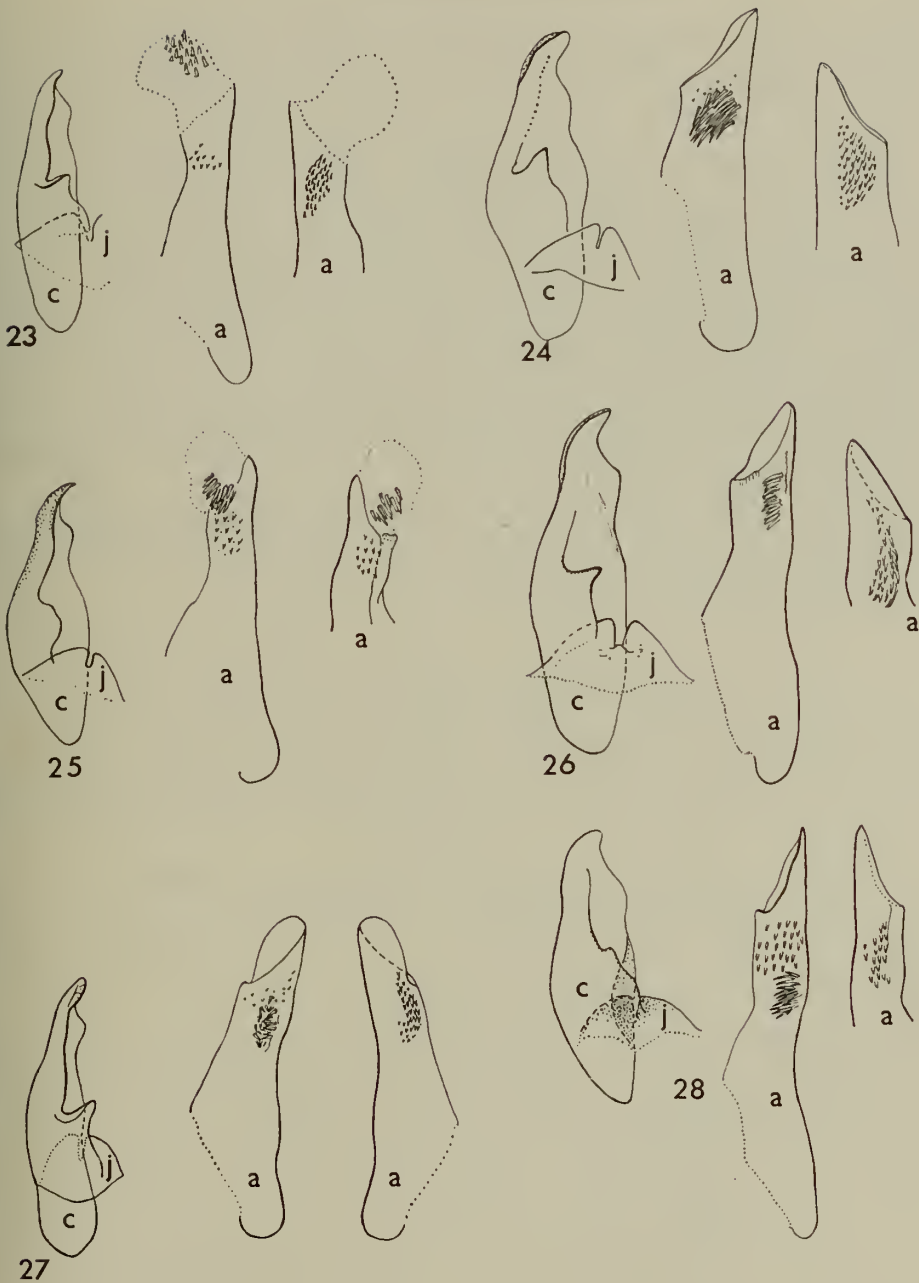
♂ genitalia. The clasp is smaller than that of *trimeni* and has the dorsal projection reduced to nothing more than an obtuse angle. The aedeagus is short and stout with well developed patches of recurved hooks, one on the left, the other on the right side.

Specimens were met with a good many years ago in Natal and in East Griqualand, i.e. north of Greytown on the 11th December, 1952, in the first instance; on the grassy slopes of Mt Marwaga (at an altitude of some 5,500 feet), Bulwer, when this mountain was being climbed in company with Mr T. W. Schofield; and in East Griqualand at the road-side in a flat stretch of country between Pietmaritzburg and Kokstad. This small insect did not answer to any of the *Aloeides* species known at that time, and it is recalled that Mr Pennington himself commented upon this fact, and on the difficulty of insects of this nature. The butterfly does not differ in its habits from the related species of *Aloeides*; it is a gregarious species, and habitually alights on the ground or at times on short vegetation, where it rests with its wings closed and is not easily noticed. (C.G.C.D.)

The species is named after Miss Susan J. May, lately on the staff of the BMNH, whose conscientious work has contributed to the completion of this paper.

Holotype ♂, NATAL: Muden, 7.i.1949 (*H. Cookson*), B.M. Type No. Rh. 17233.

Paratypes. NATAL: Muden, 12.i.1949 (*Cookson*), 1 ♀ (allotype, B.M. Type No. Rh. 17234); Muden, 1948–1949 (*Cookson*), 7 ♂, 8 ♀ (BMNH); Muden, x–xii.1951 (*Cookson*), 8 ♂, 4 ♀ (TM, Pretoria); Karkloof, ex Trimen Coll., 1 ♂ (BMNH); Karkloof, 17.x.1951 (*Cookson*), 1 ♂ (TM, Pretoria); Balgowan, 1934–1935 (*R. C. Wood*), 1 ♂, 1 ♀ (NMR, Bulawayo); Balgowan (*Pennington*), 3 ♂ (Penn.); Balgowan, 28.x.1935 (*Pennington*), 1 ♂ (TM, Pretoria); Balgowan, 17.xii.1963 (*Plowes*), 1 ♂ (Pl.); Greytown Hills, 1953–1954 (*Cookson*), 2 ♂, 3 ♀ (TM, Pretoria).



FIGS 23-28. Male genitalia of *Aloeides*. 23, *A. taikosama*; 24, *A. plowesi*; 25, *A. susanae*; 26, *A. damarensis damarensis*; 27, *A. trimeni trimeni*; 28, *A. aranda* (j = juxta, c = clasper, a = aedeagus in each case).

Aloeides damarensis (Trimen)

This species occurs in many localities scattered over most of Southern Africa; it is found in South West Africa, Botswana, Rhodesia, Mozambique, Transvaal, Natal and Cape Province. There is some degree of geographical variation, but this is most difficult to define owing to the great degree of individual variation. Examination of some 230 specimens indicates that the general trend is for the South West African and Namaqualand specimens to be pale in colour and but weakly marked marginally with brown; Cape Province specimens on the whole are deeper tawny orange in colour with wider dusky brown margins, although some individuals do occur that are not distinguishable from South West African examples. The dusky brown marginal markings attain their greatest development in examples from Rhodesia and Mozambique, but in Botswana and Northern Transvaal a very mixed population exists, containing extremes of both light and dark forms, and intergradations between them. The existence of such a mixed population does not preclude the treatment of the more homogeneous population of Rhodesia and Mozambique as a subspecies.

♂ genitalia. These organs are very similar in size and appearance to those of *Aloeides pierus*; they can be distinguished by the more produced and more pointed projection on the dorsal edge of the valves.

Aloeides damarensis damarensis (Trimen)

(Pl. 2, figs 84, 85, 101 and 102; Pl. 3, figs 105-107, 122-124; Text-fig. 26)

Zeritis damarensis Trimen, 1891 : 90. Holotype ♂, SOUTH WEST AFRICA: Omaramba Omatako, i. 1888 (*A. W. Eriksson*) (depository unknown).

Zeritis molomo var. A Trimen, 1887 : 206, Griqualand West.

Zeritis damarensis var. Trimen, 1904 : 240, pl. 19, figs 5, 5a & 5b, Kimberley.

Phasis damarensis ab. *punctata* Aurivillius, 1924 : 427, Kimberley.

Aloeides damarensis (Trimen) Clark & Dickson, 1971 : 232-233, pl. 108, figs 1, 1a-5. [Life history.]

Length of fore wing; ♂ 14-18 mm; ♀ 16-20 mm.

Compared with *A. molomo*, both sexes are paler in colour on both upper and under surfaces, and are on the whole larger. Trimen described *damarensis* from three male examples from Omaramba Omatako, Damaraland, collected by A. W. Eriksson, and stated that they represented the same species as that he described - in both sexes - as *A. molomo* var. A. (1887), coming from Griqualand West. None of these original specimens are in the BMNH. His first reference to the female under the name *damarensis* was to the example he described and figured as *damarensis* var. (1904); this insect is in the BMNH and it bears a label 'Namaqualand, O'okiep (*R. Lightfoot*) 7.x.1890.' It is an average example of the sex from the South West Africa-Namaqualand area; it has the distal band of the fore wing reduced to a series of conjoined interneural, wedge-shaped spots, and the apical patch reduced to a roughly quadrangular spot, situated beyond the

end of the cell. It does not appear to differ materially from Trimen's description of his so-called *molomo* var. A ♀. Populations exist in some areas which suggest that they may represent localized minor races, but owing to the general similarity in the males, and the great diversity of individual variation in the females, it has not been found possible to define them. A series from Cradock in the BMNH contains two quite distinct forms of females: one usually large in size is of the typical Namaqualand form, pale in colour with reduced markings; the other is smaller, deeper in colour, and altogether more heavily marked, having on the fore wing a wide dusky brown distal band, and an apical patch very like that of the male. Aurivillius gave the name ab. *punctata* to Trimen's *damerensis* var. (1904: pl. 19, fig. 5b), and his description agrees well with this figure. The sex is not mentioned, but the name can only be applied to the extreme female form, having on the fore wing the apical patch entirely absent, the distal band reduced to a series of interneural spots, and without a dusky brown apical patch on the hind wing. The original of Trimen's figure is in the BMNH, and other of Trimen's specimens from the same locality (Kimberley) are in the South African Museum, Cape Town, all are of the same form.

This species flies in much of the Karroo, and in other portions of Southern Africa, including some of the desert-like tracts with sandy ground, as well as in grasslands. In a northerly direction from Cape Town, its habitats have been found to commence at Koekenaap, and near Clanwilliam, although it may possibly occur somewhat further South. Specimens normally settle on the ground with the wings closed (as in the case with other *Aloeides* species) and are inconspicuous against the similarly coloured background. There is much variation in the size of specimens, the smaller examples presumably having developed under particularly dry conditions. A species of *Aspalathus* was used by Gowan Clark when partially rearing a larva from the egg. (C.G.C.D.)

MATERIAL EXAMINED.

SOUTH WEST AFRICA: Okahandja, 27.i-2.ii.1922 (*R. E. Turner*), 2 ♂, 4 ♀ (BMNH); 'Tropical S.W. Africa (*A. W. Eriksson*) ex Trimen Coll.', 1 ♀ (BMNH); Aus, 16.ix.1950 (*G. van Son*), 1 ♂, 2 ♀ (TM, Pretoria). CAPE PROVINCE: O'okiep, ex Trimen Coll., 2 ♂, 2 ♀ (BMNH); Spectakel, ex Trimen Coll., 1 ♂, 1 ♀ (BMNH); Springbok, ex Trimen, 1 ♂, 1 ♀ (BMNH); Springbok, 2.x.1955 (*H. Cookson*), 6 ♂, 1 ♀ (TM, Pretoria); Kamieskroon, 16.xi.1948 (*G. van Son*), 1 ♀ (TM, Pretoria); Kuruman, xi. 1923, ex Cator Coll., 2 ♂, 3 ♀ (BMNH); Kuruman, i. 1956 (*C. D. Quickelberge*), 1 ♂ (Q); Maritzani, 4.xii.1920, ex Cator Coll., 1 ♀ (BMNH); Twee Rivieren, ii. 1956 (*Kalahari-Gemsbok Park Exp.*), 1 ♂, 5 ♀ (TM, Pretoria); Twee Riviere, 20.v.1956 (*H. K. Munro*), 1 ♂, 1 ♀ (TM, Pretoria); Cradock, (*Clark & Dickson*), 3 ♂, 12 ♀ (BMNH); Teebus, 5.x.1967 (*Mrs R. E. Southey*), 3 ♂, 3 ♀ (BMNH); Eastpoort, x. 1967 (*J. C. McMaster*), 5 ♂, 2 ♀ (McM); Cradock, Prince Albert, Matjesfontein, Kendrew, Naudes Pass, Beaufort West, Calitzdorp, Klippaat, Oudtshoorn, Aberdeen Distr., Steynsburg, Oudepoort, Ondekloof, Kliphoeck and Teebus (various collectors and dates), 22 ♂, 14 ♀ (TM, Pretoria). NATAL: 10-12.xi.1968 (*Potgeiter & Jones*), 1 ♂ (TM, Pretoria). TRANSVAAL:

Pretoria, 15.ii.1907 (*Swierstra*), 2 ♂, 1 ♀, 21.iv.1916, 1 ♀ (TM, Pretoria); Pretoria, 23.iii.1917 (*W. Impey*), 2 ♂, 1 ♀ (TM, Pretoria); N.E. Zoutpansberg Distr., vii-viii. 1916 (*H. G. Breyer*), 2 ♂, 1 ♀ (TM, Pretoria); Olifant's Camp, 17.xi.1961 (*Vari & Rorke*), 1 ♂ (TM, Pretoria); Rooiberg, i-ii. 1912, 4 ♂, 4 ♀ (TM, Pretoria); Great Salt Pan, 15.v.1953 (*R. Badham*), 2 ♀ (TM, Pretoria). BOTSWANA: Ghanzi, 1924-1926 (*J. Maurice*), 1 ♂, 3 ♀ (BMNH); Botletle River, 1 ♀ (NMR, Bulawayo); Mahalapye, 8.iv.1954 (*Pennington*), 1 ♂ (Penn.); Mahalapye, iv. 1954 (*Cookson*), 1 ♂, 1 ♀ (TM, Pretoria); Nkate, Makarikari, viii. 1930 (*V.-L. Kal. Exp.*), 2 ♂, 1 ♀ (TM, Pretoria); Damara Pan, iv. 1930 (*V.-L. Kal. Exp.*), 1 ♂, 1 ♀ (TM, Pretoria); Metsimaklaba, 111.1930 (*V.-L. Kal. Exp.*), 1 ♂ (TM, Pretoria); Lobatsi, 2.x.1957 (*Cookson*), 1 ♀ (TM, Pretoria).

Aloeides damarensis mashona subsp. n.

(Pl. 2, figs 86, 87, 103 and 104)

♂ upperside. Like the nominate *damarensis*, but differs in the much greater extent of the dusky brown areas on all wings. The fore wing has a dusky brown area at the base, which extends to approximately half of areas 1, 2 and 3; above vein 3 it unites with the lower edge of the apical patch, which in turn is partially separated from the distal band by a finger of the tawny orange ground in areas 5, 6 and 7. There is a pale (almost white) spot at the cell-end. On the hind wing, the dusky brown area extends from the base over the entire costa as far as vein 6, its outer edge being angled inwardly and terminating at a point mid-way on vein 1. The remainder of the wing is tawny orange, bordered by the continuous marginal lunules to which is attached a series of five submarginal dusky spots.

♀ upperside. Darkened at the base of the fore wing, but less so than in the male. The apical patch is large and irregular in shape and is only joined to the distal band by a narrow bar at the costa. The distal band is wide, but in most examples is broken into interneural wedge shaped spots in areas 2, 3 and 4. The remainder of the wing is tawny orange. The hind wing is basically like that of the male, but the dusky brown basal area does not quite reach vein 6, and the submarginal spots – usually seven in number – are completely free from the distal lunules.

♂ ♀ underside. The pattern does not differ materially from that of the nominate race.

In parts of Botswana and Northern Transvaal there is something of a cline, specimens that could be assigned to *mashona* occurring together with examples of nominate *damarensis*, and some intermediates. The Rhodesian and Mozambique populations – although varying individually – do form a sufficiently homogeneous group to render the naming of this subspecies desirable.

Holotype ♂, RHODESIA: Bulawayo, 8.xii.1928 (Dr Cator Coll.), B.M. Type No. Rh. 17235.

Paratypes. RHODESIA: Salisbury, 5.xii.1897 (*G. A. K. Marshall*), 1 ♀ (allotype, B.M. Type No. Rh. 17236); Salisbury, 11.ix.1962 (*Plowes*), 1 ♂ (Pl.); Bulawayo, 22.ii.1927 (*Stevenson*), 1 ♂ (NMR, Bulawayo); Mt Selinda, xi-xii. 1930 (*Stevenson*), 1 ♂ (NMR, Bulawayo); Sabi Valley, 1.v.1945 (*Mr & Mrs B. C. Cox*), 1 ♂, 1 ♀ (NMR, Bulawayo); Sabi Valley, 28.i.1961 (*Plowes*), 1 ♂ (Pl.); Sabi, Lundi R. Junction, 5.iii.1968 (*Plowes*), 4 ♂, 2 ♀ (Pl.); Nyamandhlovu, 22.i.1956 (*Plowes*),

1 ♂ (Pl.); Nyamandhlovu, 2.ii.1962 (*Plowes*), 1 ♂ (Pl.); Birchenough Bridge, Sabi R., 6.vi.1960 (*Plowes*), 3 ♂ (Pl.); Niangadzi, Sabi Valley, 12.i.1959 (*Plowes*), 1 ♂ (Pl.); Gwanda District, 24.i.1956 (*Plowes*), 1 ♀ (Pl.). MOZAMBIQUE: Delagoa Bay (various collectors), 9 ♂, 8 ♀ (BMNH).

Aloeides pierus (Cramer)

(Pl. 3, figs 110-112 and 127-129; Text-fig. 29)

Papilio pierus Cramer, 1779 : 84, pl. 243, figs E, F. (Depository of type unknown.)

Zeritis pierus (Cramer) Trimen, 1887 : 202.

Aloeides pierus (Cramer) Clark & Dickson, 1971 : 228-229, pl. 106, figs 1-24.

This species is readily identified by the characters given in the key, and by reference to the plates; it is individually variable, but has not produced any definite geographic races.

♂ upperside. Varies from examples having only vague indications of tawny orange lunules in areas 1 to 3 of the hind wing to specimens in which there are quite large areas of that colour in the outer halves of both fore and hind wings, these orange areas being divided by the darkened veins. The fringes are greyish, chequered at the vein-ends with dark brown.

♀ upperside. As in the male, this sex exhibits a great degree of individual variation in the extent of the tawny orange areas on all wings; apart from wing shape, many examples bear a great resemblance to the darker form of the male, being dusky brown with a relatively small area of tawny orange in the discal area of each wing; in others, these areas tend to increase in size, so that in more extreme cases, the main ground colour is tawny orange heavily darkened with dusky scales on the veins, and in the basal area. On the fore wing in such specimens, the distal band is very wide, and is extended inward in area 1 to approximately twice its width; the apical patch is large and triangular, but is united with the distal band only narrowly at the costa, being otherwise separated by a finger-like intrusion of the orange ground colour. A shadowy scattering of dusky scales extends between the lower edge of the apical patch and the extended portion of the distal band. In the hind wing the costal region is dusky brown to the apex, to part of area 4, and including the cell. The discal lunules are large and triangular. The fringes are chequered as in the male.

♂♀ underside. The pattern is variable, individuals occurring in which the greys and browns of the hind wing are replaced by a rich crimson. As mentioned in the key, the distinct break in the median series of spots at vein 4 is the most consistent and distinctive character.

♂ genitalia. These organs are very like those of *damarensis*; they differ in that the prominence on the dorsal edge of the clasper is much less produced, appearing in many preparations as a roughly rectangular outgrowth, whereas that of the species mentioned has an almost thumb-like appearance. The aedeagus is furnished with two well developed patches of recurved hooks.

This insect is one of the most common and widely distributed members of the group in southern Africa. It occurs in different types of floral regions, including portions of the Karroo, and varies much individually in all its habitats. Distinguishable by its characteristic form of marking on the underside of the hind wings, it is found from the coastal areas of the Western Cape to inland regions of considerable altitude, and is often encountered in large numbers, in colonies, or more generally distributed over the veld or mountain side on which the food-plants are present. Like the allied species, it habitually settles on the ground, after its quick, short

flights. Oviposition has been observed at the base of an *Aspalathus* plant, and the species has been reared successfully on plants of this genus.

The pupa has been found under a stone in or near an ants' nest; however, the larva is known to be phytophagous, and is presumably only attended by ants even under natural conditions. (C.G.C.D.)

MATERIAL EXAMINED (assembled from all the collections mentioned on p. 229).

CAPE PROVINCE: Cape Town, 39 ♂, 32 ♀; Llandudno, 1 ♂; Ceres, 4 ♂, 1 ♀; Clanwilliam, 4 ♂; Bain's Kloof, 1 ♀; Caledon, 3 ♂; Tygerberg, 1 ♂, 1 ♀; Brak River, 2 ♂, 1 ♀; Swartberg Pass, 2 ♂, 1 ♀; Uitvlugt, 6 ♂, 5 ♀; Uitenhage, 1 ♂, 4 ♀; Coega, Pt Elizabeth, 1 ♂, 1 ♀; Addo Rd, Pt Elizabeth, 1 ♀; Port Elizabeth, 1 ♀; Knysna, 1 ♂, 1 ♀; Cradock, 3 ♂, 1 ♀; Sheldon, 1 ♂; Melkbosch Strand, 1 ♂; Beaufort West, 3 ♂, 4 ♀; Hofmeyr, 1 ♂, 1 ♀; Grahamstown, 1 ♂; Eastpoort, 4 ♂, 4 ♀; Waverley, 1 ♀; Aberdeen, 1 ♂; Vlekpoort, 1 ♀; Queenstown, 1 ♂, 1 ♀; Graaff Reinet, 1 ♂, 1 ♀; Annshaw, 2 ♂; Kimberley, 3 ♀. ORANGE FREE STATE: 1898 (*C. Bowker*) ex Trimen Coll., 1 ♂ (BMNH).

Aloeides trimeni sp. n.

(Pl. 3, figs 113-117 and 130-134; Text-fig. 27)

Zeritis pierus var. B; Trimen, 1866 : 275.

[*Zeritis taikosama* (Wallengren) Trimen, 1887 : 203. Misidentification.]

Aloeides species?; Clark & Dickson, 1971 : 229-232, pl. 107, figs 1-23.

Trimen's misidentification of *Cygaritis taikosama* Wallengren has made necessary the substitution of the present name for this species, as has been already explained under *A. taikosama* on p. 251. It is a widespread and very variable insect, having the appearance above of a small example of *A. pierus*, and as in that species varying greatly in the extent of the tawny orange areas on all wings. The underside varies on the hind wing in the colour of the ground, and in the definition of the spotting; examples occur that have these spots but weakly marked, whereas others have heavily ringed dark spots with centres exhibiting a most striking metallic lustre. The median series is slightly sinuate, but it is never broken at vein 4 as is that of *A. pierus*. In spite of the strong tendency to individual variation. it has so far been found possible to separate only one subspecies.

Aloeides trimeni trimeni subsp. n.

Length of fore wing: ♂ 12-15 mm; ♀ 12-17 mm.

♂ upperside. The ground colour is dull brown, in most cases with some indication of tawny orange areas in the submarginal area of the fore wing; in more extreme cases, these areas take the form of a regular band of spots, extending from area 2 towards the costa, those in areas 2 and 3 being the larger. The holotype is of this form. Other examples are completely dull brown, and every intermediate between the two forms occurs; some examples exhibit a whitish spot at the cell end, and some a pale indeterminate tawny area at the base. In the hind wing, the general colour is dull brown, with blackish distal lunules; in the more

strongly marked specimens these lunules are bordered inwardly by a band of tawny orange which is intersected by the darkened veins. The fringes are greyish with dark brown chequering at the vein ends, but this chequering is not so definite as that of *pierus*.

♀ upperside. Apart from wing shape, basically like that of the male. There is a strong tendency for the tawny areas to be more extensive, so much so that some individuals have the dusky brown areas reduced to an apical patch and a wide distal band on the fore wing, and only the costal area and apical patch of the hind wing. In such specimens the remainder of the wings is tawny orange, so producing a pattern rather like that of *damarensis* female, and certainly more usual in females of the genus. The fringes are like those of the male.

♂ ♀ underside. This surface is of the usual *Aloeides* pattern; the spotting on the fore wing is complete, the spots in the cell being black-ringed with clear white centres. The seven spots of the submarginal series are black, and in contrast with those of *pierus*, all are definitely touched with white inwardly. The hind wing varies in colour from greyish brown through various shades of pale brown, red-brown, but never to crimson as is the case in some other species in the genus. The spotting is regular in pattern, the individual ring-like spots, being a darker shade of the ground colour with lighter centres. In some examples these centres have a strong metallic lustre, appearing in certain lights as shining golden points.

This insect was reared on *Aspalathus* by Gowan Clark, from Port Elizabeth material.

Holotype ♂, TRANSVAAL: Witpoortje, 24.ix.1967 (*W. H. Henning*), B.M. Type No. Rh. 17237.

Paratypes. TRANSVAAL: Witpoortje, 24.ix.1967 (*W. H. Henning*), 1 ♀ (allotype, B.M. Type No. Rh. 17238); Witpoortje, 1966-1967 (*W. H. Henning*), 34 ♂, 20 ♀ (BMNH).

Material excluded from the type-series (from various collections). TRANSVAAL: Belfast, 1 ♂; Graylingstad, 6 ♂, 3 ♀; Heidelberg, 1 ♀; Pietersburg, 2 ♀; 4 ♂, 3 ♀; Pretoria, 1 ♂, 1 ♀; Johannesburg, 3 ♂, 3 ♀; Shilouvane, 1 ♂; Rustenburg, 1 ♂; Potchefstroom, 9 ♂, 6 ♀. NATAL: Frere, 2 ♂; Estcourt, 9 ♂, 3 ♀; Muden, 9 ♂, 3 ♀; Utrecht, 4 ♂, 3 ♀. ORANGE FREE STATE: Harrismith, 2 ♂, 1 ♀; Lindley, 1 ♀. CAPE PROVINCE: Annschaw, 9 ♂, 11 ♀; Healdtown, 1 ♂; Somerset East, 2 ♀; Transkei, 8 ♂, 4 ♀; Stutterheim, 3 ♂, 1 ♀; Prudhoe, 1 ♂, 1 ♀; Fort Beaufort, 3 ♂, 1 ♀; Port Elizabeth, 2 ♀; Mitchener's Pass, 1 ♂; Bedford Distr., 1 ♂; Waverley, 1 ♀; Cathcart, 6 ♂, 2 ♀; Cradock, 6 ♂, 1 ♀; Vlekpoort, 6 ♂, 1 ♀; Teebus, 2 ♀; Wanstead, East Griqualand, 4 ♂, 3 ♀. RHODESIA: Inyanga, 3 ♂, 3 ♀.

Aloeides trimeni southeyae subsp. n.

(Pl. 3, figs 109 and 126)

As far as is known, this dark race exists in isolation in the Mossel Bay area, well to the west of any other known locality for nominate *trimeni*. It is named after Mrs R. Southey of Pretoria in recognition of her many contributions to South African entomology, and her help in connection with the present paper.

Length of fore wing: ♂ 13-14.5 mm; ♀ 15 mm.

♂ upperside. The colour is dusky brown on all wings, darker than in most examples of *trimeni*, which it otherwise closely resembles. In certain lights, a faint golden sheen is visible, but in all the specimens examined there is no indication of any tawny orange markings at

all; the only marks visible are an indistinct pale spot at the cell-end on the fore wing and the vaguely indicated submarginal lunules on the hind wing.

♀ upperside. This sex is only known from the allotype. On the fore wing, the base and basal third of the costa are fuscous; the costal patch is large, dusky brown, its lower edge extending from above the cell to vein 4 in a rounded arc, and then turns towards the costa before uniting with the distal band. The distal band is wide (3-4 mm), and in areas 1 and 2 extends inwards to at least twice that width. The remainder of the wing is tawny orange the veins being heavily darkened with dusky scales. On the hind wing, the base is ochreous fuscous, which colour merges into the dusky brown outer two-thirds of the wing. The distal lunules are visible and are margined inwardly by a series of five tawny orange lunules.

♂♀ underside. Very like that of nominate *trimeni*, only differing in the rather more greyish tinge of the hind wing, and in the heavier dusky scaling to be seen in the subapical portion of the tawny orange area of the fore wing in the males.

This race should not be confused with certain forms of *trimeni trimeni*, having a similar appearance on the upperside. A case in point is the 4 ♂, 3 ♀ from Utrecht (Dr Kroon); these, though in the main dusky brown above, have at least vestiges of tawny orange submarginal spots on the hind wing, and a warmer tone of ground colour on the under surface. Two of the Witpoortje paratypes are also of this form, and similar specimens from the Haenertsburg area have been examined. On the evidence available, such examples can only be treated as forms of *trimeni*, possibly with some degree of dominance in some areas.

When investigating a suitable-looking spot for butterflies on the right-hand side of the national road six miles from, and west of, Mossel Bay, on the 20th November 1950, four males of this insect were found flying close to, and settling on, the ground. It was immediately noticed how dark all these specimens were, and though the basic pattern of the underside was seen to resemble that of the usual form of *trimeni* (considered at that time to be *taikosama* Wallengren), the virtually uniform blackish brown uppersides showed clearly that they were distinct from normal *trimeni* (of which the writer had much previous experience near Port Elizabeth). The locality concerned was a small, rough, somewhat stony piece of the veld lying a little lower than the surrounding ground, owing to its having been scoured out in the past after rains. The single female which was caught in 1965 was found on a hillside sparsely covered with short vegetation - 18 miles west of the first spot. *A. pierus* was much in evidence in both these localities, and both species behaved in a similar manner. (C.G.C.D.)

Holotype ♂, CAPE PROVINCE: nr Mossel Bay, 20.ix.1950 (C. G. C. Dickson), B.M. Type No. Rh. 17239.

Paratypes. CAPE PROVINCE: nr Mossel Bay, 20.ix.1950 (Dickson), 3 ♂ (BMNH), 1 ♂ (D.); Hills east side of Gauritz River Bridge, 12.iii.1965 (Dickson), 1 ♀ (allotype); (D.) Brak River, 2.xii.1938 (R. C. Wood), 2 ♂ (BMNH).

Aloeides swanepoeli sp. n.

(Pl. 3, figs 118, 119, 135 and 136)

Closely allied to *A. trimeni*, and to some extent occupying parts of the range of that species, it is characterized by its widely tawny upperside, and by the usually heavy, continuous, band-like formation of the median series on the under-

side of the hind wing. The species has long been known to many collectors, and various suggestions have been made as to its identity. C.G.C.D. found the species on various occasions from 1953 onwards in an open area covered with short grass and low-growing plants at Botha's Hill. The butterfly was seen to have similar habits to other *Aloeiides*, frequently settling on the ground after its short haphazard flights. Though decidedly active under favourable conditions, it never strayed far from its original location. The marked expanse of the tawny orange colouring of the upperside in comparison with that of *trimeni* was observed as soon as the first specimens were caught, and it was realized that this feature was of considerable significance. Mr Swanepoel (*in litt.*) referred to it recently as 'species X', and writing of the species in the Munnik-Soekmekaar district of Transvaal says: 'This then is the picture. Here in a small area *trimeni* flies all by itself. Not far away, sometimes a quarter of a mile or nearer, X flies by itself. I have seen these two species in many places there; in a few they were together. The conclusion that I have come to is that they have nothing to do with one another. As X extends further southwards into Natal, it occurs in many places here and there along the eastern slopes of the Drakensberg Range where *trimeni* is often completely absent. There is no doubt in my mind that it is a distinct species.'

Fore wing length: ♂ 13-16 mm; ♀ 15-18 mm.

♂ upperside. The fore wing is predominantly pale tawny orange, and has an apical patch of moderate size and a distal band of up to 3 mm in width. The tawny colour penetrates towards the costa usually in the form of tawny spots in areas 5, 6 and 7. In the median area the veins are darkened by dusky scales. On the hind wing the ground colour is like that of the fore wing; the basal third of the wing, the costal region above the cell and vein 6, extending into area 5 below the apex, and a series of submarginal spots fused to the distal lunules, are all dusky brown. The veins are less strongly darkened than those on the fore wing. The fringes on all wings are pale fuscous with dark chequering at the vein-ends.

The great extent and more tawny tone of the ground colour serve to distinguish this species from *A. trimeni*.

♀ upperside. Apart from wing-shape, this sex does not differ from the males, except that the tawny ground colour tends to be even more widely extended.

♂ ♀ underside. The fore wing is deeper tawny orange than the upperside. The pattern is as in *trimeni* with well marked silver-white black ringed spots. The submarginal series and the marginal dots decrease in size and definition as they near the apex. The costal and distal areas of the wing are of matching colour with the hind wing. This varies individually in colour from greyish fawn to rich reddish tawny brown, the spotting consisting of brownish rings with paler somewhat silvery centres. The median series is well marked, continuous, and slightly sinuous, and gives a rather striking band-like effect in most examples.

The species is named after Mr D. A. Swanepoel in acknowledgement of his helpful criticism.

Holotype ♂, NATAL: Botha's Hill (above railway line) 2,500', 29.ix.1953 (C. G. C. Dickson), B.M. Type No. Rh. 17241.

Paratypes. NATAL: Data as holotype, 1 ♀ (allotype, B.M. Type No. Rh. 17242); as holotype, 21.ix.1953, 2 ♂, 21.x.1953, 1 ♀ (D.); Estcourt, 14-15.ix.1967 (*D. M. Kroon*), 2 ♂, 1 ♀ (Kr.); Estcourt, 1895 (*Hutcheson*), 2 ♂ (BMNH); Estcourt, ix-x. 1896 (*Marshall*), 5 ♂, 1 ♀ (BMNH); Estcourt (Trimen Coll.), 3 ♂, 4 ♀ (BMNH); Muden (*Cookson*), 9 ♂, 13 ♀ (BMNH), 5 ♂, 1 ♀ (TM, Pretoria); Frere, 10.xii.1896

(*Marshall*), 1 ♂ (BMNH); Utrecht, 16.ix.1967 (*Kroon*), 1 ♀ (Kr.); Ulundi, ix. 1896 (*Marshall*), 4 ♂, 2 ♀ (BMNH); Empangeni, Zululand, 1913-1914 (*Higgins*), 3 ♂, 2 ♀ (BMNH). TRANSVAAL: Shilouvane (*Junod*), 4 ♂ (BMNH); Munnik, 2.x.1946 (*Henning*), 1 ♂ (BMNH); Munnik, 17.viii.1944 (*Pennington*), 1 ♂ (Penn.); Munnik, 3.x.1961 (*Plowes*), 1 ♂ (Pl.); Wolkberg, x. 1942 (Swanepoel), 1 ♀ (BMNH); Barberton, 5 ♂ (BMNH); Carolina, 14.x.1961 (*Plowes*), 4 ♂ (Pl.); Fairview Mine, Barberton, 10.x.1961 (*Plowes*), 1 ♂ (Pl.); Zoekmekaar, 28.x.1959 (*Plowes*), 1 ♂ (Pl.); Zoutpansberg, 1957-1959, 3 ♂ (Pl.); Louis Trichardt (*H. G. Breijer*), 3 ♂, 5 ♀ (TM, Pretoria).

Coloured photographs of examples of this species have been received from Mr L. N. Schroder, who caught the specimens at Mhlambinyati, Swaziland in October 1967.

Aloeides aranda (Wallengren)

(Pl. 3, figs 120, 121, 137 and 138; Pl. 4, figs 139-148 and 156-165; Text-fig. 28)

Cygaritis aranda Wallengren, 1857 : 43. LECTOTYPE ♂, by present designation, 'Caffraria' (NR, Stockholm) [examined].

Zeritis mars Trimen, 1862 : 285. Holotype ♂, CAPE PROVINCE: Knysna (depository unknown).

Aloeides zilka Grose-Smith, 1900 : 121, pl. 26, figs 1-2. Holotype ♂, SOUTH AFRICA (BMNH) [examined].

Zeritis rougemonti Oberthür, 1909 : 98. Holotype ♂, TRANSVAAL: Shilouvane, Zoutpansberg (*Junod*) (BMNH) [examined].

Phasis marshalli Aurivillius, 1924 : 427. Holotype, RHODESIA: Gazaland* (depository unknown).

Aloeides aranda aranda (Wallengren) Clark & Dickson, 1971 : 221-224, pl. 104, figs 1-23.

Length of fore wing: ♂ 11-16 mm; ♀ 13-17 mm.

♂ upperside. The ground colour is pale tawny orange with a slightly more yellow tinge than in most other species in the genus. The fore wing apical patch and distal band are dusky brown in colour, and of individually variable extent. On the hind wing, the tornus is strongly produced at vein 1, imparting an almost tail-like appearance. The colour is as in the fore wing; the apical patch is dusky brown, subquadrangular in shape, and rarely extends far below vein 6, the distal margin being only narrowly margined with dusky brown. The fringes are variable; in some examples, they are pale fuscous with more or less chequering at the vein-ends, some have a definite rosy tinge, while in some dark individuals (*mars*), the fringe of the fore wing is completely dusky brown as in the distal band.

♀ upperside. Apart from the broader wings, this sex is as in the male.

♂ ♀ underside. On the fore wing tawny orange; the cell spots and median series are all present, being well formed, black ringed, and with clear silver-white centres; the black sub-marginals decrease in size from area 1 towards the apex, those nearest the apex being but poorly defined. These spots are not marked with white. The apical and distal portions

* Aurivillius gives 'Gazaland' as the type-locality, and states that he received the specimens from Sir Guy Marshall. As the name Gazaland appears in many maps to cover a large area of Mozambique, it seems desirable to point out that the southern Melsetter area around Mt Selinda and Chipinga in Rhodesia adjoins Portuguese Gazaland, and is also known by that name. Sir Guy did live and collect in this area.

of the wing and the entire hind wing vary individually in colour from ochreous brown to deep crimson. The spotting on the hind wing is very variable; in most of the ochreous brown examples the spots are dusky, and poorly marked; in the crimson ones the spots are often whitish, and stand out clearly.

♂ genitalia. There are two patches of recurved hooks on the aedeagus; the cornutae within the vesica are small in size. On the clasper, the dorsal edge is rounded, and without any protruding point.

The species constitutes a gigantic though far from regular cline spreading from the heavily marked population of the western Cape Province eastwards in an amazing variety of wide-bordered and narrow-bordered forms to culminate in the weakly marked *marshalli*-like form in Mozambique. It also extends northwards to Malawi (Ncheu, *J. D. Handman*) and to Tanzania (Lupembe, *F. Zimmer*); in the BMNH there is a single ♂ example from Libollo, Angola (*Pemberton*). The populations from the geographic extremes of the range can in no way be confused, but in the intermediate areas the multiplicity of forms renders any attempt at subspecific division impossible. The published names refer in each case to an individual form which is not representative of the population as a whole in the area concerned; they can therefore only be treated as names of less than subspecific rank. Through the kindness of Dr Per Inge Persson of the Naturhistoriska Riksmuseum, Stockholm, it was possible to examine Wallengren's four syntypes of *Cygaritis aranda*; they consist of a well matched pair (male and female) with moderately wide margins and apical patch on the fore wings. These two specimens are hereby designated as lectotype male, and allolectotype female. Both the other specimens are males; one is poorly marked with narrow apical patch and distal border, the latter diminishing in width from the apex, and terminating at vein 2; the other is intermediate in the development of its dusky markings. All four are labelled 'Caffraria', a somewhat imprecise locality which might indicate any area inhabited by the Kaffers; Trimen (1887 : xii) refers to Colonel Bowker's collecting in Kaffraria and mentions that the name covers the area between the Great Kei and Bashee rivers. On the frontispiece map to Trimen's South African Butterflies, Kaffraria is shown as covering that area and most of Pondoland; it seems reasonable therefore to assume that Wallengren (who was a contemporary of Trimen) would have similar views on the matter. The Wallengren syntypes agree well with more recent specimens from the area concerned.

Form *mars* Trimen. This, the predominate form in the western Cape Province shows the greatest development of the dark margins above; the triangular apical patch with the distal band form an uninterrupted heavy black margin on the fore wing. The apical patch on the hind wing is also larger and darker than in typical *aranda*. In the eastern Cape Province it does in places occur together with typical *aranda* and *marshalli*-like examples, occasional specimens being difficult to assign to either taxon.

Form *rougemonti* Oberthür. From the type and three paratypes, this form is of doubtful significance; all four examples are very similar to one another, and are in fact intermediate between typical *aranda* and form *marshalli*, the apical patch and distal band on the fore wing being narrower than in *aranda*, and the wing shape rather more rounded. All come from Shilouvane, although the data

label of the type appears to have become detached. Oberthür states 'Décrit d'après plusieurs examplaires capturés dans le pays d'Shilouvane (Zoutpansberg, Nord-Transvaal) par M. le missionnaire Junod'. The name Shilouvane does not appear on any available map, but Dr Cottrell suggests that it is most probably a misspelling of Shiloubane near Tzaneen.

Form *zilka* Grose-Smith. This is the form exhibiting the greatest reduction in the development of the dusky margins. In the type, the apical patch on the fore wing is reduced to an attenuated smear extending parallel with but not touching the outer half of the costa, and its lower edge not reaching vein 6. The distal band is approximately 2 mm wide at the costa, rapidly narrowing to vein 3, whence it continues linearly to the anal angle. On the hind wing, the apical patch is entirely absent, and the wing is without markings except for a marginal dark line. The exact location of the type-locality is not known, but two examples from Inyanga, Rhodesia in BMNH are very like the type, and Dr Cottrell (in litt.) mentions two others from Headlands; it does appear that the type may well have originated in that area. It can only be treated as an extreme form of *marshalli* occurring together with that form, typical *aranda*, and many intermediates.

Form *marshalli* Aurivillius. On the fore wing above, the marginal band terminates at vein 2, and encloses small yellowish submarginal spots in areas 2, 3 and 4; in one female example from Inyanga, these spots are continued as a series of seven rounded orange spots extending upwards to the apex. The apical patch is usually only slightly larger than that of *zilka*, streak-like, and not extending below vein 6. The apical patch on the hind wing is present but never so well developed as that of typical *aranda*. A series of specimens from Inyanga contains both forms *zilka* and *marshalli*, together with f. *aranda* and intermediates. The type was collected by G. A. K. Marshall and the locality given as 'Gazaland' must refer to the Chipinga region in S.W. Rhodesia. A series of 10 ♂, and 3 ♀ from the Delagoa Bay area are all of the *marshalli* form, but are considerably smaller than the Inyanga specimens. A pair from Muzi Forest, Ingawumu, Zululand, exhibit some affinity with Rhodesian *zilka-marshalli* forms (Pl. 3, figs 120, 121, 137 and 138).

A. aranda usually occurs in more or less mountainous areas, but is sometimes found in low-lying sandy tracts near the coast. It has been observed that specimens taken in the latter type of habitat (i.e. near Mamre in the Western Cape) often have the underside markings on the hind wings noticeably white and conspicuous. Examples with the dark areas of the upperside abnormally developed have been encountered near Cape Hangklip. Much variation in the general tone of the underside (from sandy brown to rich lake) occurs in examples from any given locality. The butterfly behaves in a manner similar to other ground-frequenting species of the genus, sometimes settling on low-growing vegetation as well as on the ground itself. It was reared by Gowan Clark on *Aspalathus* (Leguminosae).

DISTRIBUTION. Cape Province; Swaziland; Natal; Transvaal; Rhodesia; Mozambique; Tanzania (Lupembe); Malawi (Ncheu); Angola (Libollo). Over 200 specimens have been examined.

Aloeides henningi sp. n.

(Pl. 4, figs 149, 150, 166 and 167; Text-fig. 30)

Aloeides sp. ? Clark & Dickson, 1971 : 225-228, pl. 105, figs 1, 2, 3, 4, 6, 8, 10, 12 and 14. [Life-history.]

This insect has long been treated as *Aloeides almeida*; it does however exhibit constant differences in facies, male genitalia, and ecology, and must therefore be accorded specific status. In acknowledgement of their help, and many generous gifts of specimens to the BMNH, the species is named after Mr W. Henning and his sons Graham and Stephen of Florida, Transvaal. Mr Henning points out that in the Strubens Valley area the species is single-brooded, not appearing after November.

Length of fore wing: ♂ 14-16 m; ♀ 14-17 mm.

♂. Very similar to *A. almeida*, differing as follows; the fore wing is shorter, its apex being distinctly more acute; the distal margin is less strongly convex; on the upperside, the tawny orange ground is brighter and clearer, and the veins very finely lined black. The apical patch and distal margin are deep black brown, arranged as in *almeida*; but aberrant examples do occur in which the black brown colour encroaches into the tawny orange ground, and in some extreme cases completely replacing it on all wings. The hind wing only differs from that of *almeida* in its brighter colouring, and less heavily blackened veins. The pale fuscous fringes are spotted with dusky brown at the vein ends.

♀. Not noticeably different in shape from that sex of *almeida*, but the more typical specimens have the tawny orange areas brighter, more extensive, and much more finely darkened on the veins. The markings on all wings are as in *almeida*, although as in the male, individuals do occur with a strong tendency to melanism.

♂♀ underside. This surface only differs from that of *almeida* in that the spots in the cell and disc of the fore wing are larger, and their silver-white centres more striking. The submarginal spots are smaller and well separated, whereas those of *almeida* are large, tending to fill almost the whole area between the veins, and thus are much closer together.

♂ genitalia. The aedeagus has a well developed patch of recurved hooks on its right side, but unlike *almeida*, is entirely without such a patch on the left side. On the dorsal edge of the clasper, the projection is only represented by an obtuse angle; it is never finger-like as in species like *taikosama*.

This species was reared on *Aspalathus* by Gowan Clark.

Holotype ♂, TRANSVAAL: Struben's Valley, Constantia Kloof, 22.x.1967 (*W. H. Henning*), B.M. Type No. Rh. 17243.

Paratypes. TRANSVAAL: data as holotype, 1 ♀ (allotype, B.M. Type No. Rh. 17244), 14 ♂, 4 ♀ (BMNH); locality as holotype, various dates, 1 ♂, 4 ♀ (Henn.); Pretoria, 1.xii.1945 (*N. Impey*), 1 ♂ (TM, Pretoria); Pretoria, 1945-49 (*van Son*), 2 ♂, 1 ♀ (TM, Pretoria); Pretoria, ix. 1897 (*C. J. Swierstra*), 1 ♀ (TM, Pretoria); Fountains, Pretoria, 31.x.1959 (*Plowes*), 1 ♀ (Pl.); Johannesburg, 4 ♂, 2 ♀ (BMNH); Johannesburg, 15.x.1951 (*A. L. Capener*), 4 ♂, 1 ♀ (TM, Pretoria); Johannesburg, ix-x. 1902-3 (*A. Ross*), 4 ♂, 2 ♀ (BMNH); Fairview Mine, Barberton, 12.x.1961 (*Plowes*), 2 ♀ (Pl.); Sheba Mine, Barberton, 11.x.1949 (*van Son*), 1 ♂ (TM, Pretoria); Irene, 11.x.1908 (*Swierstra*), 1 ♀ (TM, Pretoria); 5 miles N. of Volksrust, 15.x.1961 (*Plowes*), 1 ♂ (Pl.); Pilgrim's Rest, 4.x.1961 (*Plowes*), 1 ♂ (Pl.).

Material excluded from the type-series. NATAL: Muden, 12.i.1947 (*H. Cookson*), 1 ♂ (BMNH); Muden, 12.x.1951 (*Cookson*), 1 ♀ (TM, Pretoria); Greytown Hills, 25.x.1954, 1 ♀ (TM, Pretoria); Estcourt, 10.x.1890, 1 ♂ (BMNH); Beaconsfield, Escourt, 14.xi.1949 (*Plowes*), 1 ♀ (Pl.); Fairleigh, Estcourt, 5.xi.1959 (*Plowes*), 4 ♂, 6 ♀ (Pl.). LESOTHO: Maseru (*Bowker*) ex Trimen coll., 2 ♂ (BMNH); Maseru, x. 1901 (*Crawshay*) 6 ♀ (BMNH); 'Basutoland' (*Bowker*), ex Trimen coll., 1 ♂ (BMNH). ORANGE FREE STATE: Dewetsdorp, 28.xi.1967 (*Mrs R. J. Southey*), 1 ♂ (BMNH); Ladybrand, 20.xi.1931, 1 ♀ (NMR, Bulawayo). EAST GRIQUALAND: Umzimkulu, 9.v.1926 (*Pennington*), 1 ♂ (Penn.); Lundean Pass, 29.xi.1967 (*L. Southey*), 3 ♀ (BMNH).

Aloeides almeida (Felder)

(Pl. 4, figs 154, 155, 171 and 172; Text-fig. 31)

Nais almeida Felder, 1862 : 478. Holotype ♂, CAPE PROVINCE: 'Cap.' (*Frauenfeld*), ex Felder coll. (BMNH) [examined].

Zeritis almeida (Felder) Trimen, 1887 : 200, partim.

In the past, this name has been made to include the taxa now described as *henningi* and *macmasteri*; the elucidation of the complex now requires that an attempt be made to decide from which area in the Cape Province the holotype actually came. Careful comparison with the material in the BMNH reveals that it does in fact agree exactly with examples from the Knysna area (some of which were also originally in the Felder collection), and it can be safely assumed that the holotype originated from that district.

Length of fore wing: ♂ 12-14 mm; ♀ 14-16 mm.

♂. The fore wing is rather broader than that of *A. henningi*, its apex less acute, and the strongly convex distal margin is in many examples slightly angled at vein 5. On the upper side, the tawny orange ground is much constricted by the heavy dusky brown marginal markings, and the veins are strongly darkened by blackish scales. The apical patch is wide, extending almost to vein 4, and almost to the base of the costa, being weakly sprinkled with yellowish scales in the latter area. On the hind wing, the apical patch is subquadrangular and united with the dusky costal area. The distal lunules are united in a continuous wavy band. In the tawny orange area, the veins are darkened as are those of the fore wing. The fringes are fuscous with darker chequering at the vein-ends.

♀. The wings are broader, but are marked much as in the male. In many examples the tawny orange ground extends through the apical patch of the fore wing towards the costa in the form of three interneural spots in areas 4, 5 and 6.

♂♀. On the underside, the costal and distal areas of the fore wing vary individually in colour from earth-brown through various shades of red-brown to deep crimson. On the fore wing, the spots in the cell and the median series are all present, but are rather small; the submarginal series are large, without white centres, and decrease in size as they approach the apex; between them and the margin is a series of tiny black spots. The pattern of the hind wing consists of rather vague and small dusky spots; the basal spots are rounded, that at the cell-end elongate, all having dimly-seen yellow-brown centres; those of the median series are crescent-shaped, well separated, and each is accompanied internally by a touch

of yellow-brown. The submarginal series of lunules is scarcely visible, but is followed by a series of rounded cloudy dusky spots.

♂ genitalia. The aedeagus differs from that of *A. henningi* in both that left and right side bear a patch of recurved hooks.

MATERIAL EXAMINED.

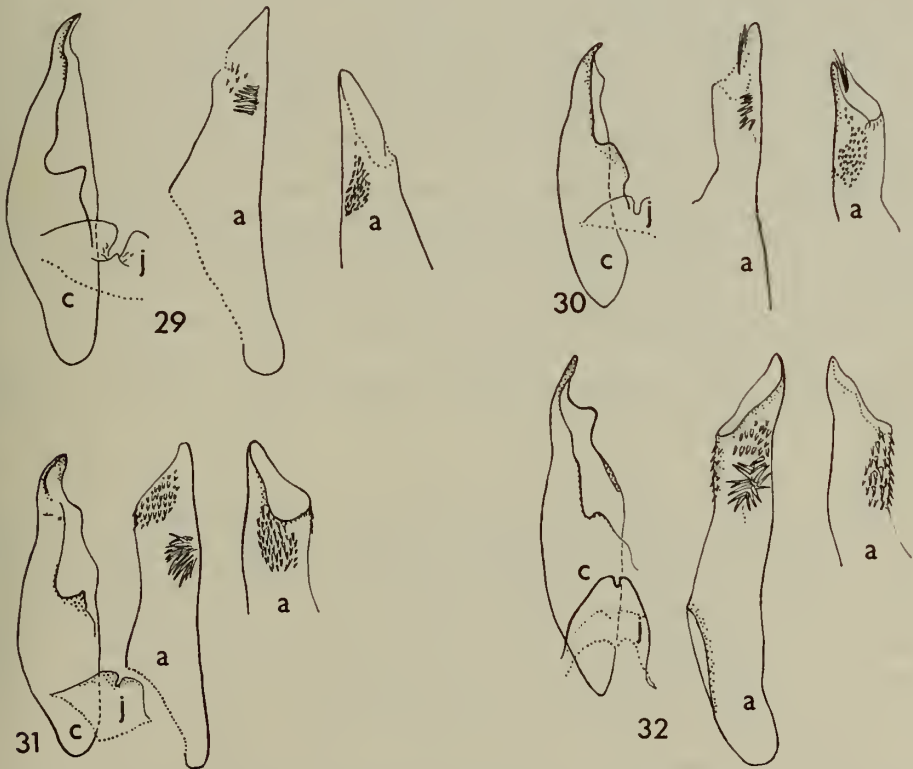
CAPE PROVINCE: Cape Town, 4 ♂, 1 ♀; Plettenburg Bay, 2 ♂; Knysna, 2 ♂; Oudtshoorn, 1 ♀ (all BMNH).

Aloeides macmasteri sp. n.

(Pl. 4, figs 152, 153, 169 and 170; Text-fig. 32)

[*Zeritis almeida* (Felder); Trimen, 1887 : 200, partim.]

This, the largest and handsomest member of the *almeida* complex, inhabits the more western parts of Cape Province, but is known to extend westward as far as Kamieskroon in Little Namaqualand; it differs from *almeida* in size and wing-



FIGS 29-32. Male genitalia of *Aloeides*. 29, *A. pierus*; 30, *A. henningi*; 31, *A. almeida*; 32, *A. macmasteri* (j = juxta, c = clasper, a = aedeagus, in each case).

shape, and is best treated as a distinct species. The late Mr G. C. Clark knew the species well and was also of the opinion that it was distinct. The name is put forward in recognition of the generous loan of specimens, and of help given by Mr J. C. McMaster of Stutterheim.

Length of fore wing: ♂ 14.5–17.5 mm; ♀ 15–20 mm.

♂. The fore wing is much longer in proportion than that of *almeida*; on its upper side, the tint of the tawny orange ground is brighter, and the veins are clearly marked with black. In the holotype the apical patch is large, but is partially divided in areas 4, 5 and 6 by three internervular spots of the ground colour; the wide distal margin measures approximately 3 mm at its narrowest point at vein 3; a scattering of black scales extends from its inner edge in area 1 and across areas 2 and 3 to join the lower edge of the apical patch. In some examples, this scattering is much more intense, dividing the tawny orange area into two parts, so that specimens do occur in which the tawny orange is confined to the basal third of the wing, and to two rounded spots in areas 2 and 3. On the hind wing, the apical patch is united with the wide dusky costal area, and extends downward to between veins 4 and 3; some examples have a dusky scattering – similar to that of the fore wing – extending across the wing to the hind margin. In the darkest specimens, the basal two-thirds of the wing are black-brown, leaving only the outer portions of areas 1, 2, 3 and 4 tawny orange. The cilia on both wings are lighter and more obviously chequered than those of *almeida*, the fringe at the anal angle of the fore wing being noticeably whiter.

♀ upperside. The pattern is basically like that of the male, but the tawny orange areas are usually more extensive, and the tawny orange spots dividing the apical patch are larger. The distal band is approximately 4 mm wide at vein 3, but extends in area 1 to a width of about 6.5 mm; in many examples, this portion is joined to the apical patch by a shadowy band as in the male. The basal portion of the hind wing is paler fuscous, the wing being otherwise like that of the male.

♂ ♀ underside. The fore wing ground colour is paler tawny orange than that of *almeida*, the margins being pale brown with a tinge of salmon; the hind margin and the anal angle are broadly white. The spotting is similar to that of *almeida*. On the hind wing, the ground is the same colour as the fore wing margin, and the markings do not differ from those of *almeida*.

The male genitalia differ from those of the previous species only by their greater size.

Holotype ♂, CAPE PROVINCE: Hillmoor, Steynsburg, 21.xi.1965 (*Mrs R. J. Southey*), B.M. Type No. Rh. 17245.

Paratypes. CAPE PROVINCE: as holotype, 1 ♀ (allotype, B.M. Type No. Rh. 17246), 1 ♂, 2 ♀ (BMNH); Hillmoor, Steynsburg, 19.xii.1963 (*Mrs Southey*) 1 ♀ (Q.); Steynsburg, i–ii. 1964 (*Mrs Southey*), 3 ♀ (TM, Pretoria); Eastpoort, x. 1966–7 (*J. C. McMaster*), 2 ♂, 3 ♀ (McM.); Katberg, xi. 1940 (*McMaster*), 1 ♂ (NMR, Bulawayo); Cathcart, 1964–6 (*McMaster*), 4 ♂, 1 ♀ (McM.); Cathcart, 13.x.1963 (*C. D. Quickelberge*), 1 ♂ (Q.); Gaika's Kop, Amatola Mtns, 26.xii.1965 (*McMaster*), 1 ♂ (McM.); Isidenge, 11.xi.1964 (*McMaster*), 3 ♂ 1 ♀ (McM.); Sheldon, 4.x.1934, 1 ♂ (BMNH); Murraysburg, ex Trimen Coll., 1 ♂, 2 ♀ (BMNH); Coega, xii. 1948, ex Jackson Coll., 2 ♀ (BMNH); Port Elizabeth, x. 1965, ex Jackson Coll., 1 ♀ (BMNH); Glenconnor, 26–7.xi.1942 (*G. C. Clark*), 2 ♀ (TM, Pretoria); Carlton, 16.xi.1936 (*Clark*), 2 ♀ (TM, Pretoria); Aberdeen District, 20.iii.1940 (*G. van Son*), 1 ♀ (TM, Pretoria); Wolfefontein, 1.iii.1943 (*Clark*), 1 ♀ (TM, Pretoria).

ADDENDA TO THE *ALOEIDES THYRA* COMPLEX*Aloeides caledoni* sp. n.

(Pl. 4, figs 151 and 168)

This species, recently discovered by C.G.C.D. at Shaw's Mountain, Caledon District, bears some resemblance to *Aloeides quichelbergei* Tite & Dickson (1968 : 381, pl. 3, figs 54-55 and 65-66); it does however exhibit a number of quite distinctive characters.

Length of fore wing: ♂ 17-18 mm.

♂. In appearance similar to that sex of *A. quichelbergei*; the fore wing is less pointed, and the distal margin less straight, being very slightly angled at vein 4. On the upperside, the tawny orange ground is bright and clear, undarkened at the veins, and lighter in colour than that of *quichelbergei*. The fore wing apical patch is narrower, and extends only just over half the length of the costa; whence it continues along the subcostal vein as a thin pointed streak. The base of the costa is widely ochraceous. The distal band is narrow, seldom exceeding 2 mm in width at vein 3, and diminishing slightly as it approaches the anal angle, whereas that of *quichelbergei* is definitely widened in area 1. On the hind wing, the apical patch is narrow and band-like, not at all quadrangular. The cilia on all wings are white with dusky brown chequering at the vein-ends. On the underside of the fore wing, the absence or vestigial nature of some of the spots gives a much plainer appearance than is to be seen on any other species in the genus. The ground colour is paler tawny orange than that of the upperside, fading to pale straw-yellow at the hind margin. The costal and distal margins coloured as in the hind wing. The three well defined cell spots are black ringed with white centres; in one example, the basal and middle one are joined by a black bar in both fore wings. The median series are all small, sometimes vestigial, and usually only present in areas 3 to 7. The submarginal series is represented by a clouded dusky spot in area 1, tiny or obsolescent dots in areas 2 and 3, no spots being discernable between this point and the apex. On the hind wing, the colour is a smooth rich crimson, not so deep as that of *quichelbergei* but quite striking. All the spots from the base to the median series are white faintly edged with blackish, while the submarginal series is either absent or scarcely discernible. The marginal white dots are not present. One specimen is in very rubbed condition, and probably because of this, the ground appears to be more fuscous than crimson, and the pattern is scarcely traceable.

In fresher specimens, there is a conspicuous vinous colouring on the head, the upper part of the body, and a tinge of the same colour on the fringe of the hind wing.

♀. Unknown.

The original specimen was taken by C.G.C.D. on the 3rd November, 1967. It was flying on the rather flat summit of a small rocky hill on which *A. aranda* f. *mars* was present in small numbers. This insect was decidedly quick on the wing, but it settled once or twice near the edge of the hill, and was eventually captured. Although not a fresh specimen, it looked very bright when flying in the sunshine, and was - in this respect - reminiscent of one of the larger European coppers. As it obviously represented a previously unknown *Aloeides*, an intensive search was made for more specimens, but without success either on that day or in later searches during the same season. This seems to suggest that it is a single-brooded species with an early flight period; however, complete evidence of this is still lacking. A point was made of revisiting the locality at an earlier date in the

following season, and although no further specimens could be found on the little hill itself, others were located in the vicinity.

Holotype ♂, CAPE PROVINCE: Shaw's Mountain, south of Caledon, 28.x.1968 (C. G. Dickson), B.M. Type No. Rh. 17247.

Paratypes. CAPE PROVINCE: as holotype, 3 ♂ (BMNH), 1 ♂ (D); as holotype, 3.xi.1967, 1 ♂ (D).

***Aloeides juana* Tite & Dickson stat. n.**

Aloeides vansoni juana Tite & Dickson, 1968 : 379, pl. 3, figs 48, 51, 59, 62. Holotype ♂, CAPE PROVINCE: hills $3\frac{1}{2}$ miles south of Ladismith, 1.ix.1965 (C. G. Dickson) (BMNH) [examined].

Since the description of this taxon, several well-authenticated reports of its being observed flying together with typical *A. vansoni vansoni* have come to hand. C.G.C.D. found the two insects flying together on a mountain near Prince Albert on the Swartberg Pass in November 1969. Mr Plowes found both species in Little Namaqualand at Struder's Pass, and kindly sent specimens of each on loan for identification; these were taken in November 1969. Mr Swanepoel reports that during his collecting trips in 1968–1969, he too found the two species together, and formed the opinion that they were distinct. He claims to have detected differences in their habits. There is no doubt therefore that *juana* is in fact a species completely separate from *vansoni*. Mr Pennington confirms that many specimens in his collection support the difference.

***Aloeides pallida littoralis* Tite & Dickson**

Aloeides pallida littoralis Tite & Dickson, 1968 : 375, pl. 2, figs 25, 26, 35 and 36, Knysna.

The capture of a series of this subspecies at Hermanus, Cape Province, on 7.xi.1970 by Mr C. J. Rossouw further extends its known range to the west, and tends to confirm that it is a lowland maritime race. All these examples are remarkable for their brilliant colouring, and their strikingly emphasized underside wing-pattern.

NOTES ON THE EARLY STAGES OF *ALOEIDES TRIMENI* SP. N.
AND *A. DENTATIS* (SWIERSTRA).

By C. G. C. Dickson

Aloeides trimeni

(Pl. 5, figs 178–181)

The eggs of this species were obtained at Witpoortjie, Transvaal, by Mr W. H. Henning, with the help of his sons Stephen and Graham – the food-plant proving to be *Hermannia depressa* N. E. Br. (Sterculiaceae). No plant of this genus had

been known before to be used as a food-plant by any of the species of *Aloeides*. Eggs were laid singly on the young leaves or buds. From one of these eggs the species was reared to the adult stage, in Cape Town, and during this period Mr Henning very obligingly maintained a constant supply of fresh food-plant by air-mail. No ants were in attendance at any time when the larva was being reared.

The egg is 0.8–0.9 mm in diameter and is rather deeply 'bun-shaped'. The surface sculpturing is moderately fine, and consists of well raised protuberances connected by small, concavely arched ridges. The micropyle is sunken. When first laid, the colour is creamy white, but in time darkens considerably. The egg in question was laid in early November 1948, and hatched approximately two weeks later.

The larva, 1st instar. On emergence, the larva is 1.5 mm in length, when moderately extended, and during this instar is of a light yellowish colour, streaked longitudinally with vinous colouring, and marked at each end with the same colour. The head is rounded, very dark brown to black, shiny, and with some short white setae. The neck shield, and the very small circular anal shield are both brown. The retractile tubercles are already present in the usual position on segment xi, with the exterior portion of each tubercle in the form of a fleshy protuberance, but the honey-gland is not developed at this early stage. The setae on the body of the larva are mostly of moderate length, but with some shorter ones. They are largely pale in colour, but some, including the dorsal series, are dark-coloured. A stout lateral series is light-coloured with rounded club-shaped ends. The instar lasts approximately two weeks, at the end of which the length of the larva is 2.5 mm.

Descriptive note on the second to fourth instars have not been made. After the first moult the larva bears a much closer resemblance to the final instar. The retractile tubercles have chitinized casings after the first moult.

2nd instar. The duration is 18 days. The length of the larva at the end of the instar is 4.5 mm.

3rd instar. The duration is 16 days. The length of larva at the end of the instar is 7 mm.

4th instar. The duration is 15 days. The length of the larva at the end of the instar is 10 mm.

5th instar. The head is dark brown to blackish, with numerous very short white setae. The neck shield and anal shield are light-brown. The general colour of the body is pale green, with darker green longitudinal streaks, the double medio-dorsal ones relatively straight and the others irregular; each of the second series (i.e. second from the centre line of body) has an ochreous patch on segments ii to ix. The chitinous tubercle casings have the usual protective spines round their rims. The setae vary much in length, the longest occurring at the anterior end of the body, towards the posterior end of an outer dorsal series, and at the posterior end of the body. The setae are either light- or dark-coloured. As is usual in the more advanced larvae of this general group of butterflies (i.e. in most of the instars) the body is covered with numerous very short setae of a specialised type, with horizontally expanded ends, and these contribute to part of the pattern, as on the anal shield, which bears two concentrations of white setae of this type. The light coloured lateral setae, referred to in the description of the first instar, besides being more numerous than at that stage (as is the case with the setae in general) are now relatively smaller and less robust. The duration of the instar is 17 days. The length of the larva at the end of the instar is 15 mm.

6th (final) instar. This instar is very similar to the previous one, and the description already given can be applied in general to the present instar. The ochreous patches which are combined with the second series of longitudinal streaks are more prominent, and are of richer colour. As is normally so in larvae of this group, the setae as a whole have again increased in number, but are relatively shorter than before. The duration of the instar is 23 days, the larva pupating on 27.ii.1968, the final length of the larva being 20 mm.

The pupa. This is 11 mm in length, and is of the general form typical of this genus and allied genera. It is fairly thick in proportion to its length, is rounded anteriorly, and

terminates obtusely. Its colour is finally of a brown tone. The pupal stage is 16 days, a male imago emerging on the 15th March 1968. This butterfly is a darkly marked one, with full orange colouring only in a limited portion of the hind wings. The length of the fore wing is 13.5 mm.

Aloeides dentatis

(Pl. 5, figs 173-177 and 182)

Several eggs of *Aloeides dentatis* were obtained from Mr Henning. They were laid by Witpoortje females in January 1969, and from one of them a larva was reared to the third instar in Cape Town. In the following season, a pupa was found by Graham Henning in an ants' nest (*Camponotus* sp.) below plants of *Hermannia depressa*, which proved to be the food-plant of this *Aloeides* in the locality. Part of the life-history of the species can thus be recorded for the first time. The Hennings are the first to bring to light the early stages of any representatives of this genus in the Transvaal.

The larva concerned fed readily on the young leaves of the food-plant, devouring the leaf surface, and forming furrows in it, up to the end of the second instar. In the third instar, it appeared to make some slight attempt to eat the leaves, but then wandered about, and failed even to select a resting place for itself on some particular leaf as it had done formerly, and to which it always returned after its periods of feeding. Such behaviour seemed to suggest that *A. dentatis* was an exception to the known rule in this genus, and that the larva might be entirely dependent on ants from the third instar onwards, and not merely attended by them as is the case in other species of *Aloeides* whose life-histories are known. The subsequent discovery of the pupa in the ants' nest does appear to point to this being so, and it will be of great interest if the remaining larval instars are in fact found to be passed in ants' nests. The larva died eventually.

The egg is 0.8 mm in diameter and is deeply 'bun-shaped' in form. There is a bold surface pattern of well raised protuberances, which are more or less rimmed round their tops in the case of the largest ones, and which have some fine concavely-arched intervening ridges. The colour at first is creamy white, changing in time to somewhat purplish brown. The egg under observation was laid on 13.i.1969, and hatched 13 days later.

The larva, 1st instar on emergence is 1.75 mm in length, and in this instar is of a pale dull stone colour (with a slightly greenish tinge), and has deep wine-red streaks. The head and the large neck shield are black; the anal shield is only slightly darker than the ground-colour. The setae are mostly dark, and their arrangement and lengths on segment vii when viewed from the side are very much as in *Aloeides gowani* (Tite & Dickson, 1968 : pl. 6, fig. 17). The long lateral setae do not increase progressively in length towards the anal end, as in *A. gowani*. The duration of the instar is 15 days, at the end of which the larva measures 3.25 mm. The larva eats only the surface of the leaf, leaving patches or short little furrows.

2nd instar. The head is black with light coloured setae. The large neck-shield and the small circular anal shield are dark brown. The general colour of the body is light yellowish, and the longitudinal streaks and other markings are deep vinous to vinous-brown. The black tubercle casings on segment xi are short, and bear the characteristic protective spines.

The setae of various lengths include an outer dorsal series dark in colour, some of which are fairly long, and a lateral series light in colour, including relatively long ones. The duration of the instar was 25 days, at the end of which the larva measured 6 mm.

3rd instar. The head is black, the body stone with deep vinous or vinous brown longitudinal streaks and markings. The tubercle cases are prominent. The head and anal shields are dark, and the setae largely black. As already mentioned the larva failed to survive.

Penultimate (probably 5th) instar. The discovery of one penultimate and one final instar larva of this species in an ants' nest by Mr Stephen Henning on 25th July 1970 has now made it possible to include this further portion of the life-history in these notes. Both larvae remained in a dormant state for a considerable period after their arrival at Cape Town, and the one in the final instar, without further feeding, duly pupated early in the following summer. It is thus clear that the larva hibernates if pupation has not taken place before the winter.

In the penultimate instar the head is very dark brown, and bears many lighter coloured and very short setae. The broad neck-shield, and small rounded anal shield are black, the former with a light median streak. The body is of a light stone colour with longitudinal streaks or series of broken markings of a reddish brown or somewhat vinous colour, being disposed in the manner usual in the larvae of this and allied species; the double medio-dorsal lines clearly defined, and the series of markings well above the lateral ridge are heavier and more prominent than any of the other series. Some marking of the same colour also occurs on the posterior segments. Between the medio-dorsal lines and the last-mentioned series is a comparatively large patch of ochreous on the more posterior portion of each of segments 2 to 9, and with similar but less extensive colouring on segment 10. The rather short chitinous tubercle casings on segment 11 are black. The setae are of various lengths, and are most prominent subdorsally and laterally, and at the extremities of the body, others short or fairly short - occurring rather sparsely on the remainder of the surface. As is usual in the group, numerous small specialized setae with expanded heads are present on the surface of the body, accentuating the pattern in places, including some of the lighter marking. The retractile tubercles function at times with rapid beats when the larva is disturbed, the white eversible organs being clearly apparent, even to the naked eye. The larvae were not accompanied by ants at any time when they were being reared, in this or in any of the other instars. The duration of this instar could not be recorded, but 196 days elapsed between the date of its capture and the 8th February 1971, when it finally changed to the final instar. The length of the larva at the end of the penultimate instar was 13.5 mm when moderately extended.

Final instar. A full description of this instar is not necessary, because of its very close resemblance to the previous one. Its duration was 42 days. The larva at the end of the period measured 18 mm. It remained sluggish in its movements up to the time pupation occurred, feeding only a short distance from where it rested, and remaining inert for long periods. Pupation took place on a leaf on the lower surface of the container in which it was confined, with the pupa horizontal and lying more or less on its ventral surface, and attached by the cremastral hooks to its support. The butterfly, a somewhat small female, emerged on the 12th March, 18 days after pupation. The short pupal period in this case was presumably due to the time of year, almost the warmest part of the summer at the Cape.

For some time the larva described above was fed on *Hermannia depressa* supplied by Mr Henning, the soft leaves of which were readily devoured. It was found, however, that the yellow flowers of *Hermannia althaeifolia* were equally suitable for the purpose, although the larva appeared to reject the thick pilose leaves of this plant. The latter species of *Hermannia* was obtained on Lion's Head, Cape Town, the habitat of at least two other species of *Aloeides*. In the light of this experience, it may well prove to be one of the natural food-plants of the genus in the south western Cape, with the possibility of local larvae having adapted themselves to feeding on the leaves as well as on the flowers.

The most interesting discovery of the two advanced larvae of *A. dentatis* is described hereunder in Stephen Henning's own words:

'On the 26th July 1970, we decided to search for larvae or pupae of *Al. dentatis* at Witpoortjie as my brother Graham had discovered a pupa there the previous spring (September 1st, 1969) in the ants' nest under a stone. The veld had been burnt, but not too fiercely, and sometime previously, as parts were showing a few blades of green grass. All the *dentatis* food-plant had been burnt, and none could be located. We started on one side of their habitat systematically turning over the larger stones. Having covered most of the area with no success, I was becoming discouraged when, as I was replacing a large stone, I noticed, clinging to the under surface among the remnants of the tunnels, a large brownish-grey slug-like larva (± 24 mm long). It seemed to me to be a bit too large for that of *dentatis*. I was still contemplating this as I turned over the next stone and found another larva. This was much smaller (± 11 mm) and made an active attempt to escape. It was only captured after much scraping and digging with my fingers as it vanished into the heart of the ants' nest. The ants on this occasion seemed to be of a different species to the ones found attending the pupa, being smaller and more slight in structure. These were the only larvae found, but it should be noted that the veld had been burnt, including all the *dentatis* food-plant.'

From the size of the larva in the final instar which was found in the nest, it is apparent that the other larva did not increase in size to the extent which would have been expected under natural conditions. Although the smaller larva continued to eat the food-plant used in the early instars, the fact of these advanced larvae having been located in ants' nests suggests that the larva of *dentatis* might not be entirely phytophagous throughout its life in the normal environment – unless the ant association has simply led to the larva making use of the nest as a suitable retreat as well as a place in which to pupate.

The pupa. This is similar in form to that of *A. trimeni*, and measures 12.5 mm. When photographed by Mr. Henning, the colour was golden-brown, partly tinged with green. The colour would presumably become darker ultimately. A male imago emerged from this pupa on the 21st September 1969, its fore wing length being 13.5 mm.

CHECK-LIST OF THE SPECIES AND SUBSPECIES OF *ALOEIDES*

ALOEIDES Hübner

thyra (L.)

nycetus Stoll

evadrus Fabricius

pallida pallida (Riley)

pallida grandis Tite & Dickson

pallida littoralis Tite & Dickson

dentatis dentatis (Swierstra)

dentatis maseruna (Riley)

braueri Tite & Dickson

simplex (Trimen)

vansoni Tite & Dickson

juana Tite & Dickson

dryas Tite & Dickson

penningtoni Tite & Dickson

natalensis Tite & Dickson

quickelbergei Tite & Dickson

caledoni sp. n.

oreas Tite & Dickson

clarki Tite & Dickson

gowani Tite & Dickson

depicta depicta Tite & Dickson

depicta apicalis Tite & Dickson

arida Tite & Dickson

lutescens Tite & Dickson

egerides (Riley)

- margaretae* Tite & Dickson
molomo molomo (Trimen)
molomo krooni subsp. n.
molomo coalescens subsp. n.
molomo mumbuensis Riley
molomo kiellandi Carcasson
molomo handmani subsp. n.
barklyi (Trimen)
conradsi conradsi (Aurivillius)
conradsi talboti subsp. n.
conradsi jacksoni subsp. n.
conradsi angoniensis subsp. n.
angolensis sp. n.
stevensoni sp. n.
griseus Riley
taikosama (Wallengren) comb. n.
orthrus Trimen syn. n.
- plowesi* sp. n.
susanae sp. n.
damarensis damarensis (Trimen)
damarensis mashona subsp. n.
pierus (Cramer)
trimeni trimeni sp. et subsp. n.
trimeni southeyae subsp. n.
swanepoeli sp. n.
aranda (Wallengren)
mars Trimen
zilka Grose-Smith
rougemonti Oberthür
marshalli Aurivillius
henningi sp. n.
almeida (Felder)
macmasteri sp. n.

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